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# PULP & PAPER

August 1989

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## FIVE MILLS INSTALL NEW FORMER • 76

## BASEBALL CARD MARKET SIZZLES • 102

Volume 63
Number 8

# AUGUST

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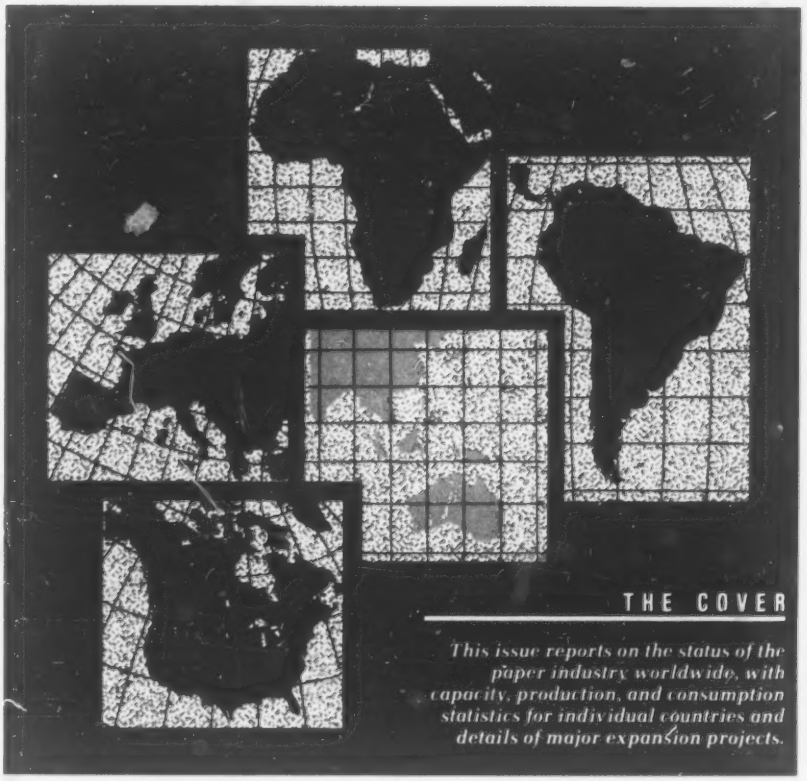

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*This issue reports on the status of the paper industry worldwide, with capacity, production, and consumption statistics for individual countries and details of major expansion projects.*

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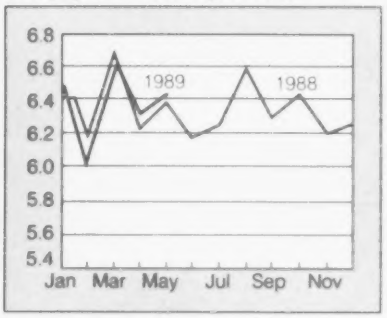
ABP

BPA

**U.S. paper and board production**




**U.S. production** of paper and paperboard totaled 6.4 million tons in May, down 0.3% from the same month last year, according to the American Paper Institute. After seasonal adjustments, overall production was 0.9% lower through the first five months than in 1988, reflecting the slowdown that has overtaken the general economy. Lower demand and inventory trimming led to a 1.5% decline in paper production through May. Paperboard production was off just 0.2% over the same period, thanks in part to continued strength in export markets.

**Among major grades**, uncoated groundwood and tissue were the only paper grades showing higher production levels than last year. Printing and writing paper was off 1.7%, with lower volumes for most end uses. Containerboard production held steady compared with last year, and fiber box shipments were up 1.9% after adjusting for an extra day this year.

**Canadian newsprint** shipments totaled 851,000 metric tons in May, down 0.6% from last year. Downtime at eastern mills has lowered operating rates for the first five months to 96%, down from 100% a year earlier. Pulp shipments totaled 640,000 tons, down 6.3%, with mills operating at 90% through May. ■

| | Latest month (000 short tons) | | % change from year ago | Annualized year-to-date (000 short tons) | % change from year ago |
|---|---|---|---|---|---|
| **PAPER & PAPERBOARD PRODUCTION**[1] | | | | | |
| Newsprint | May | 504 | -1.9 | 5,922 | -1.2 |
| Uncoated groundwood (s) | May | 142 | 5.2 | 1,730 | 8.1 |
| Coated paper (s) | May | 577 | -4.0 | 6,978 | -5.9 |
| Uncoated free-sheet (s) | May | 937 | 1.7 | 11,280 | -0.5 |
| Other printing/writing | May | 126 | -0.8 | 1,525 | -0.7 |
| Total packaging and other paper (s) | May | 395 | -5.7 | 5,029 | -4.8 |
| Tissue | May | 474 | 2.8 | 5,592 | 2.6 |
| **Total paper** | **May** | **3,155** | **-0.7** | **38,056** | **-1.5** |
| Unbleached kraft paperboard | May | 1,681 | 1.8 | 19,441 | 0.2 |
| Semichemical medium | May | 468 | 4.7 | 5,708 | 1.5 |
| Bleached paperboard | May | 382 | 6.1 | 4,440 | -1.7 |
| Recycled paperboard | May | 735 | -3.4 | 8,778 | -2.7 |
| **Total paperboard** | **May** | **3,265** | **0.0** | **38,366** | **-0.2** |
| **Total U.S. paper and paperboard output** | **May** | **6,421** | **-0.3** | **76,422** | **-0.9** |
| **PULP, WASTEPAPER & FIBER**[2] | | | | | |
| Total U.S. woodpulp production | Apr. | 5,193 | 3.8 | 62,361 | 1.8 |
| Market pulp production | Apr. | 717 | 6.1 | 8,858 | 4.1 |
| Wastepaper consumption at paper/board mills | Apr. | 1,550 | 0.6 | 18,674 | -0.4 |
| Pulpwood consumption (cords) | Apr. | 8,040 | -1.2 | 97,212 | 0.1 |
| **CONVERTED PRODUCTS STATISTICS**[3] | | | | | |
| Corrugated box shipments (billion ft²) | May | 26.734 | 6.8 | 130.633[6] | 1.8 |
| Containerboard inventories at U.S. box plants and mills | May 1 | 2,564 | 0.5 | | |
| **INTERNATIONAL TRADE**[2] | | | | | |
| U.S. paper imports (including products) | Apr. | 1,045 | -1.7 | 12,711 | -1.1 |
| Imports of Canadian newsprint | Apr. | 667 | -2.9 | 7,889[6] | -7.9 |
| U.S. paper exports (including products) | Apr. | 489 | -1.2 | 6,171 | 9.4 |
| Exports of unbleached kraft linerboard | Apr. | 167 | -18.5 | 2,262 | 0.9 |
| Exports of woodpulp | Apr. | 525 | 15.9 | 6,334 | 18.7 |
| Norscan pulp inventories[4] | May 31 | 844 | 8.6 | | |
| Norscan pulp operating rates[4] | May | 95% | 96% | 97% | 98% |
| **CANADIAN STATISTICS**[5] *(reported in metric tons)* | | | | | |
| Total newsprint shipments | May | 851 | -0.6 | 3,943[6] | -2.0 |
| Operating rates | May | 95% | 100% | 96% | 100% |
| Inventories held by U.S. consumers | May 31 | 1,296 | -14.0 | | |
| Other paper/board shipments | May | 576 | -0.9 | 2,773 | -1.0 |
| Woodpulp shipments (export only) | May | 640 | -6.3 | 3,276 | -1.2 |
| Operating rates | May | 89% | 93% | 90% | 95% |

1. American Paper Institute. 2. API, Bureau of Census, American Pulpwood Assn. 3. Fibre Box Assn., Paperboard Packaging Council. 4. North American/Scandinavian paper-grade market pulp. 5. Canadian Pulp & Paper Assn. 6. Not annualized. (s) = Shipments.

# Corrugating medium: High operating rates for semichemical mills but prices competitive

**Grade structure:** Corrugating medium, the middle fluting material used in corrugated containers, is made from both semichemical pulp and recycled fiber. In 1988, 76% of corrugating medium was made from semichemical furnish (which normally contains at least 20% recycled fiber), and 24% was "bogus" medium made from wastepaper. Basis weights of corrugating medium are 22, 26, 33, 36, and 40 lb/1,000 ft².

Standard sheet weight is 26 lb, which accounts for about 77% of production (although heavier weights have been growing in popularity). Recycled medium for equivalent uses is normally produced in slightly higher weights.

**Production/capacity:** U.S. production of corrugating medium rose 3.9% in 1988 to 7.4 million tons from the previous year. Semichemical medium production rose 2.3%, while recycled medium output surged 9.3%, reflecting a tight supply situation that prevailed through the first half of the year. Slower corrugated box shipments in the second half of the year caused medium supply to ease late in 1988. However, operating rates for semichemical mills still averaged 98% for the year, while recycled mills ran at 95%.

This year, the market is expected to ease further, with U.S. corrugated box shipments projected to show about a 1.8% gain compared with a 3.6% increase in 1988. Production of corrugating medium is expected to be up 0.4% in 1989, with semichemical medium showing a 1.3% increase while recycled medium is down 2.4%. As a result, semichemical medium mills are projected to run at nearly 96%, while recycled mills average 84%.

**Outlook:** With an economic slowdown but no recession forecast for 1990, box shipments are expected to be up less than 1% for the year. Corrugating medium production is projected to increase 0.7% with all of the growth in semichemical board. This would cause operating rates of semichemical mills to slip to under 94%, while recycled mills average 81%.

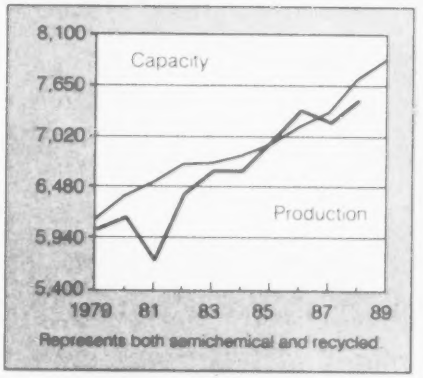
The last American Paper Institute capacity survey showed capacity for semichemical medium rising 3.2% in 1989 and 2.9% in 1990, while recycled medium jumps 10.2% this year and 3.5% next year. Actual capacity growth, however, may be somewhat slower, particularly for recycled medium with the closure of three recycled medium mills, partly offset by the shift of one West Coast medium machine from semichemical to recycled production.

No new semichemical medium machines have been announced in the U.S., although several companies are planning major rebuilds for completion over the next several years (including Mead Corp., Temple-Inland Inc. at two mills, Green Bay Packaging Inc., Virginia Fibre Corp., and Menasha Corp.), while at least two more have projects under study. A number of these projects include installation of wide-nip presses to improve quality and add incremental capacity. In recycled medium, Stone Container Corp. is expanding an existing mill, while two or three new mills are under study (one is the reactivation of an older mill).

**Prices.** Although linerboard producers unsuccessfully tried to push through a $30/ton price increase this spring, there was never even much hope that medium prices would rise. The softness in medium prices appears to reflect the easing in operating rates (particularly for recycled mills) and lower wastepaper costs. There has also been continued pressure from Canadian medium imports in the North and imports from Mexico along the border states. As a result, medium prices are currently $20 to $30/ton or more below list levels.

Year-end transaction price history for 26-lb semichemical medium in the East is as follows: 1984, $310; 1985, $240; 1986, $290 to $300; 1987, $350 to $360; 1988, $380 to $390 (vs the $410 list). Recycled medium may sell for $10 to $20 less, depending on quality and market conditions. *For additional information, see P&P FactBook.*

## SUPPLY/DEMAND (000 tons)




Represents both semichemical and recycled

## FORECAST (000 tons)

| | 1988 | 1989e | 1990e |
|---|---|---|---|
| Production | | | |
| Semichemical | 5,666 | 5,740 | 5,790 |
| Recycled | 1,757 | 1,715 | 1,715 |
| **Total** | **7,423** | **7,455** | **7,505** |
| Capacity[1] | | | |
| Semichemical | 5,796 | 5,987 | 6,160 |
| Recycled | 1,850 | 2,038 | 2,110 |
| Utilization rates | | | |
| Semichemical | 97.8% | 95.9% | 94.0% |
| Recycled | 95.0% | 84.2% | 81.3% |
| Imports[2] | 142 | 140 | 140 |
| Exports[3] | 136 | 140 | 150 |
| Apparent U.S. consumption | | | |
| 000 tons | 7,429 | 7,455 | 7,495 |
| lb/capita | 60.50 | 60.30 | 60.00 |
| GNP ratio[4] | 1.87 | 1.78 | 1.76 |

e = Estimate.
**1.** Based on American Paper Institute 1988 capacity survey. **2.** Dept. of Commerce data. **3.** API data. **4.** 000 tons/billion $ real GNP (1982$).

## TOP U.S. PRODUCERS (000 tpy)

| Company | Annual capacity: Semi-chem | Recycled medium | Total | Market share (%) |
|---|---|---|---|---|
| **1.** GNN | 980 | — | 980 | 12.2 |
| **2.** Stone | 680 | 180 | 860 | 10.7 |
| **3.** Weyco | 690 | — | 690 | 8.6 |
| **4.** Inland | 205 | 275 | 480 | 6.0 |
| **5.** Smurfit | 60[1] | 330[1] | 390 | 4.9 |
| **6.** Mead | 390 | — | 390 | 4.9 |
| **7.** IP | [illegible] | — | 370 | 4.6 |
| **8.** PCA | 28[illegible] | — | 280 | 3.5 |
| **9.** G-F | 27[illegible] | — | 275 | 3.4 |
| **10.** Va. Fibre | 2[illegible] | — | 265 | 3.3 |

Market share of top five companies: **42.4%**
Market share of top ten companies: **62.1%**
Total U.S. capacity (1989):
**8.025 million short tons**

**1.** Includes 50% of Container Corp. of America.
**2.** Includes 50% interest in 170,000-tpy semichemical medium machine at Sonoco Products Co.'s Hartsville, S.C., mill.

*NEWSPRINT*

# Smurfit, GSP stake out mill sites in Northeast

The two largest recycled newsprint producers in North America recently announced tentative plans to increase their operations more with greenfield mills somewhere in the northeastern U.S. In addition, at least five other North American newsprint producers that are not using any secondary fiber currently are seriously considering some type of expansion into recycled newsprint, with at least one looking at an eastern U.S. location, according to industry sources.

Smurfit Newsprint Corp. has announced that it will complete a feasibility study on a 255,000-metric-tpy recycled newsprint mill somewhere in the U.S. Northeast. Garden State Paper Co. said it is also studying a greenfield recycled newsprint mill in the same region.

"Several northeastern states have expressed a strong desire that a mill be built 'to create a market that will absorb the recycled waste newspaper from overloaded solid waste disposal programs,'" according to Basil Snyder Jr., GSP's chairman and CEO. "A new mill could at least double the size of the market for waste newspaper in the Northeast," he added.

At this time, GSP produces 200,000 metric tpy of recycled newsprint (using about 230,000 tpy of old newspapers) at its Garfield, N.J., mill. In addition, GSP's parent company, Media General Inc., retains a one-third interest in Southeast Paper Manufacturing Co.'s Dublin, Ga., recycled newsprint mill. It will have a capacity of 415,000 tpy when a second machine comes online later in September.

Smurfit Newsprint, a subsidiary of Jefferson Smurfit Corp., expects its new mill will use 300,000 metric tpy of wastepaper. Mill sites are being evaluated by state economic development agencies, the company stated. These plans would take precedence over Smurfit's tentative proposal to expand newsprint production at its Newberg, Ore., mill by 275,000 tpy. The company's Newberg and Oregon City, Ore., mills have a combined recycled newsprint capacity of about 561,000 tpy, which makes Smurfit the largest producer in the U.S., followed by GSP.

With increasing political pressure and legislation to reduce solid waste and growing interest by publishers, virtually all North American newsprint producers are considering how to jump on the recycling bandwagon. While capacity for virgin newsprint is slated to suffer from oversupply over the next three years, a shortage of recycled newsprint is likely.

Companies that have stated publicly that they were studying how to incorporate secondary fiber in their newsprint operations include Abitibi-Price Inc., Bowater Inc., and Donohue Inc. Also, Fletcher Challenge Canada Ltd., Noranda Inc.,Kruger Inc., and Bear Island Paper Co. are considering deinking expansions, sources indicated. More announcements are expected soon. ■

**U.S. recycled newsprint legislation.**

| State[1] | Consumption tax on virgin newsprint | Mandatory goal | Usage timetable[2] | Status |
|---|---|---|---|---|
| California | None | 25% | 1991 | Pending |
| | | 50% | 2000 | |
| Connecticut | None | 20% | 1993 | Passed |
| | | 90% | 1998 | |
| Florida | 10¢/ton until 10/92<br>50¢/ton if goal not reached | 50% | 1992 | Passed |
| Illinois | 10¢/ton | 10% | 1992 | Pending |
| | | 50% | 1998 | |
| New York | None | 10% | 1991[3] | Pending |
| Wisconsin | 10% of list price per ton | 10% | 1991 | Pending |
| | | 50% | 1994 | |

1. Does not include preference purchasing provisions for state agencies. Includes only states where legislation is most advanced; Louisiana, Minnesota, Nebraska, Oregon, Pennsylvania, Rhode Island and Virginia are other states considering similar bills.
2. Applies to amount of total consumption that must be recycled-fiber based. Ranges imply goals to be phased in between these dates.
3. Also prohibits burning old newspapers.

Source: American Newspaper Publishers Assn.

**1987 and 1988 wastepaper data (000 short tons).**

| | Consumption at U.S. paper and paperboard mills* | Exports | Total collected 1988 |
|---|---|---|---|
| News | 3,526.7 | 1,008.7 | 4,535.4 |
| Corrugated | 9,747.5 | 2,277.2 | 12,024.7 |
| Mixed | 2,180.2 | 884.8 | 3,065.0 |
| High grades | 4,615.0 | 1,469.4 | 6,084.4 |
| Total | 20,069.4 | 5,640.1 | 25,709.5 |

| | Consumption at U.S. paper and paperboard mills* | Exports | Total collected 1987 |
|---|---|---|---|
| News | 3,442.5 | 870.2 | 4,312.7 |
| Corrugated | 9,176.7 | 1,921.7 | 11,098.4 |
| Mixed | 2,116.2 | 738.1 | 2,854.3 |
| High grades | 4,465.7 | 892.3 | 5,358.0 |
| Total | 19,201.1 | 4,422.3 | 23,623.4 |

*Includes consumption at plants making molded pulp and insulation products.

Source: American Paper Institute.

# WORLD PAPER PRODUCTION HITS RECORD LEVEL FOR SIXTH YEAR IN A ROW

## But indications of a continuing slowdown of the rate of growth in demand in several sectors raise the question, Is the party over?

By PETER SUTTON, JOHN PEARSON, and HUGH O'BRIAN, International Editors

Yet another year of record output by the world's pulp, paper, and board producers, 1988 was the sixth in a row. However, sad signs indicate that the industry's longest boom period may be drawing to an end. While output and consumption are likely to carry on upward, they'll be moving up more slowly than in the past six years. This, in addition to new production capacity, may mean that some papermakers will get hurt.

The world made 226,357,000 tons of paper and paperboard in 1988, 5% more than the previous year. World pulp production has also followed the same six-year record-breaking path. Output was 160,551,000 tons in 1988, a rise of nearly 4%. So pulp provided about 70% of the papermaking furnish, the lowest proportion since 1983, when it was 75%; in fact, it's been declining by about one percentage point each year—the effect of increasing use of secondary fibers and fillers.

Apparent consumption of paper and board totaled 224,056,000 tons last year, up by 4.5% from 1987 and continuing its record run. The world's per capita consumption increased marginally to 43.8 kg (93.4 lb), up from 43 kg (94.6 lb) in 1987 and the highest level in the last 20 years.

The level of trade stayed about the same; a little more than one ton of paper in every five crosses a frontier. For pulp, about 17% of output was traded internationally. The world's export and import figures almost balanced:

*All figures in this review are in metric tons.*

### World's top 20 producing and consuming countries

**PAPER AND BOARD PRODUCTION (000 metric tons)**

| | 1988 | % change 1988/87 |
|---|---|---|
| 1. U.S. | 69,477 | +2.9 |
| 2. Japan | 24,624 | +9.3 |
| 3. Canada | 16,638 | +3.7 |
| 4. People's Rep. China | 12,645 | +10.8 |
| 5. U.S.S.R. | 10,750 | +1.7 |
| 6. Fed. Rep. Germany | 10,576 | +6.4 |
| 7. Finland | 8,653 | +8.0 |
| 8. Sweden | 8,161 | +4.2 |
| 9. France | 6,313 | +8.2 |
| 10. Italy | 5,370 | +7.7 |
| 11. Brazil | 4,639 | −1.5 |
| 12. U.K. | 4,295 | +2.7 |
| 13. Rep. Korea | 3,659 | +15.7 |
| 14. Spain | 3,429 | +5.4 |
| 15. Taiwan | 2,949 | +7.7 |
| 16. Austria | 2,650 | +12.4 |
| 17. Mexico | 2,593 | +0.7 |
| 18. Netherlands | 2,462 | +13.6 |
| 19. India | 1,915 | +1.5 |
| 20. Australia | 1,854 | +10.5 |

**PULP PRODUCTION (000 metric tons)**

| | 1988 | % change 1988/87 |
|---|---|---|
| 1. U.S. | 55,530 | +2.8 |
| 2. Canada | 23,679 | +2.9 |
| 3. Japan | 10,415 | +7.0 |
| 4. Sweden | 10,307 | +3.3 |
| 5. U.S.S.R. | 10,065 | +0.9 |
| 6. Finland | 9,001 | +6.4 |
| 7. People's Rep. China | 8,350 | +12.8 |
| 8. Brazil | 4,296 | +3.8 |
| 9. Fed. Rep. Germany | 2,358 | +4.4 |
| 10. France | 2,190 | +4.7 |
| 11. Norway | 1,917 | +1.5 |
| 12. South Africa | 1,885 | +2.4 |
| 13. Spain | 1,665 | +4.2 |
| 14. Portugal | 1,472 | +4.5 |
| 15. Austria | 1,455 | +9.2 |
| 16. New Zealand | 1,212 | +9.4 |
| 17. Czechoslovakia | 1,121 | +2.8 |
| 18. Australia | 1,051 | +9.0 |
| 19. India | 1,050 | +0.0 |
| 20. Poland | 921 | + 1.7 |

**PER CAPITA CONSUMPTION (lb/year)**

| | 1988 | % change 1988/87 |
|---|---|---|
| 1. U.S. | 699 | +9.2 |
| 2. Sweden | 685 | +30.7 |
| 3. Canada | 543 | +15.8 |
| 4. Switzerland | 459 | +10.3 |
| 5. Japan | 450 | +18.1 |
| 6. Finland | 449 | +1.1 |
| 7. Fed. Rep. Germany | 448 | +10.1 |
| 8. Denmark | 444 | +10.2 |
| 9. Belgium | 430 | +15.0 |
| 10. Netherlands | 428 | −12.3 |
| 11. U.K. | 360 | +15.4 |
| 12. New Zealand | 345 | +2.0 |
| 13. Australia | 342 | +8.6 |
| 14. Taiwan | 337 | +18.7 |
| 15. Norway | 333 | +6.7 |
| 16. Hong Kong | 323 | −0.9 |
| 17. Austria | 318 | +14.0 |
| 18. France | 313 | +13.8 |
| 19. Italy | 238 | +15.0 |
| 20. Iceland | 230 | −5.7 |

a gap of just 2.3 million tons for paper and board and of 1.2 million tons for pulp.

**RECORD-BUSTERS VI.** Europe, North America, and Asia all set new production records. And as they make 94% of the world's paper and board, they're the real record busters. Europe's total of 75.2 million tons was up nearly 5% from 1987. New records were set by Fed. Rep. Germany, which crossed the 10-million-ton mark, and Italy, which made more than 5 million tons for the first time. Other firsts included France, which made more than 6 million tons, and Sweden, which made more than 8 million tons. The three Nordic nations together made 18.5 million tons of paper and board, an incredible 25% of the continent's total, and exported 14.9 million tons of the stuff.

Asia crashed through the 50-million-ton barrier in 1988. Asia and Australasia's 29 papermakers made 52 million tons, up a staggering 15%. Japan made almost half of this total, raising its output by 2 million tons in just one year—though it saw imports rise too. People's Rep. China, Rep. Korea, and Taiwan all reached new record levels. These four nations made 84% of the continent's total, but special mention should be made of Indonesia, where output is growing fast—close to 1 million tons in 1988.

**THE BIG AMERICANS.** The U.S. secured the world's record output by making 69 million tons of paper, up nearly 3% and backed up by record exports and earnings. Prospects for 1989 are fair, but the rate of growth in consumption will probably be slower. Canada's mills ran almost flat out for the second year in a row, making more paper than ever before and exporting nearly 70% of it as well as shipping 7.2 million tons of market pulp abroad.

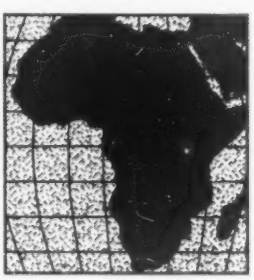
**NOT SO HOT.** The two regions that, in terms of output, did not put in the strongest of performances were South America and Africa. The former made slightly more paper and board in 1988 than it did in 1987. This was largely because output in Brazil and Argentina dropped, while in Mexico and Chile, it was almost static. The continent's pulp mills performed better, raising output by 4% to top 7 million tons.

Africa's papermakers, with the exception of South Africa, which wants to keep its output secret, are still having difficulty raising output. Once again, many of Africa's figures must be estimated, but the total 2.48 million tons of paper output effectively means it's about the same as it was in 1986. One nation worth mentioning is Zimbabwe, which is working hard to develop its paper industry.

**END OF THE PARTY?** Production figures are a reflection of the market, and there's no doubt that the world's market overall was good once again in 1988. But unmistakeable signs of a slowdown in the rate of growth in demand appeared in several major sectors as 1988 progressed. These signs have become stronger in 1989 and lead to the conclusion that the papermakers' party may be coming to an end.

These signs come mostly from the sharp end, the market: the six-month struggle to raise newsprint and kraft liner prices in the U.S., the stickiness of these same sectors in Europe, the leap in newsprint production capacity coming onstream in Europe and America, the gloomier reports from several sectors of Europe's massive printing/writing market, the increasing self-sufficiency of Asian countries (good for them, but not for importers), and the general drop in the rate of demand growth in several major countries.

These and other signs indicate a climb-down from the euphoric heights of recent years, but they may not mean a deep depression; 1989 could still be the seventh year of record production in a row. The party may be over, but hopefully it's back to normality with a slight headache rather than sinking into a deep sleep. ■



# Africa

Paper and board output by African nations is estimated at 2.5 million tons in 1988, roughly the same as in 1987. Pulp production was also a static 2.5 million tons.

South Africa is the colossus of Africa's paper industry. Unfortunately, the country no longer publishes its pulp and paper output statistics, but we estimate that it accounts for two-thirds of all of the paper that is produced in Africa and three-quarters of all of the pulp produced. In addition, South Africa also consumes approximately 40% of all of the paper and board used in the continent.

Despite its political isolation, South Africa continues to be a potent force in world export markets. Its paper industry benefits from several key advantages, among which are its fairly high per capita consumption (by African standards); its raw materials resource base; its good geographical position, which makes exporting to the Pacific Rim and elsewhere comparatively easy; and its simple industry structure, which has two giant companies—Sappi Ltd. and Mondi Paper Co. Ltd.—dominating most of the pulp and paperproduction in the country.

Further rationalization of that industry structure is now under way, with Sappi agreeing to take over the pulp interests of U.K. group Courtaulds. These amount

# Review of top 20 nations in pulp/paper production

## Australia

Population: 16,358,000. Per capita consumption of paper and board: 113 kg/249 lb. Paper and board mills: 18. Pulp mills: 19 (sulfate: 2; sulfite: 1; semichemical: 5; mechanical: 8; nonwood: 1).

**Paper/board capacity:** 2,050,000e tons **Pulp capacity:** 1,100,000e tons
**Operating rate 1988:** 90%

| | Production | | Imports | | Exports | |
|---|---|---|---|---|---|---|
| | 1987 | 1988 | 1987 | 1988 | 1987 | 1988 |
| Paper | 1,233 | 1,265 | 513 | — | 10 | — |
| Board | 445 | 589 | — | — | — | — |
| **Total** | **1,678** | **1,854** | **800e** | **800e** | **105e** | **110e** |
| Chemical woodpulp | 585 | 464 | 279 | 280e | 70 | 70e |
| Mechanicals, other pulps | 379 | 588 | 1 | 0 | 0 | 0 |
| **Total** | **964** | **1,051** | **280** | **280e** | **70** | **70e** |

## Austria

Population: 7,493,000. Per capita consumption of paper and board: 143 kg/315 lb. Paper and board mills: 33. Pulp mills: 14 (sulfate: 3; sulfite: 6; semichemical: 1; mechanical: 4).

**Paper/board capacity:** 3,001,000 tons **Pulp capacity:** 1,686,000 tons
**Operating rate 1988:** 88% **Operating rate 1988:** 86%

| | Production | | Imports | | Exports | |
|---|---|---|---|---|---|---|
| | 1987 | 1988 | 1987 | 1988 | 1987 | 1988 |
| Paper | 1,989 | 2,259 | 338 | 347 | 1,449 | 1,692 |
| Board | 368 | 391 | 24 | 70 | 269 | 292 |
| **Total** | **2,357** | **2,650** | **362** | **417** | **1,718** | **1,984** |
| Chemical woodpulp | 1,014 | 1,045 | 339 | 324 | 281 | 260 |
| Mechanicals, other pulps | 319 | 410 | 18 | 24 | 1 | 2 |
| **Total** | **1,333** | **1,455** | **357** | **348** | **282** | **262** |
| Market pulp | 363 | 363 | 357 | 348 | 282 | 262 |

## Brazil

Population: 144,427,000. Per capita consumption of paper and board: 26 kg/57 lb. Paper and board mills: 146. Pulp mills: 38.

**Paper/board capacity:** 16 tons **Pulp capacity:** 3 tons
**Operating rate 1988:** 6% **Operating rate 1988:** 4%

| | Production | | Imports | | Exports | |
|---|---|---|---|---|---|---|
| | 1987 | 1988 | 1987 | 1988 | 1987 | 1988 |
| Paper | 5,446,000 | 3,523,000 | 85 | 95 | 4,188 | |
| Board | 4,205 | 265 | 188 | 593 | 956 | 524 |
| **Total** | **434** | **3** | **3** | **16** | **49** | **4,712** |
| Chemical woodpulp | 4,639 | 268 | 191 | 609 | 1,005 | 3,591 |
| Mechanicals, other pulps | 3,709 | 44 | 55 | 807 | 1,053 | 546 |
| **Total** | **587** | **1** | **3** | **9** | **11** | **4,137** |
| Market pulp | 4,296 | 45 | 58 | 816 | 1,064 | 1,854 |

## Canada

Population: 26,093,000. Per capita consumption of paper and board: 236 kg/520 lb. Paper and board mills: 109. Pulp mills: 36.

**Paper/board capacity:** 17,028 tons **Pulp capacity:** 25,021 tons
**Operating rate 1988:** 98% **Operating rate 1988:** 95%

| | Production | | Imports | | Exports | |
|---|---|---|---|---|---|---|
| | 1987 | 1988 | 1987 | 1988 | 1987 | 1988 |
| Paper | 15,303 | 15,915 | 529 | 627 | 11,073 | 11,352 |
| Board | 742 | 723 | 229 | 324 | 80 | 68 |
| **Total** | **16,045** | **16,638** | **700** | **951** | **11,153** | **11,420** |
| Chemical woodpulp | 12,957 | 13,013 | 160 | 156 | 7,466 | 7,486 |
| Mechanicals, other pulps | 10,056 | 10,666 | 38 | 24 | 769 | 903 |
| **Total** | **23,013** | **23,679** | **198** | **180** | **8,235** | **8,389** |
| Market pulp | 8,011 | 8,227 | NA | NA | 7,090 | 7,210 |

## China, People's Rep. of

Population: 1,096,140,000. Per capita consumption of paper and board: 12 kg/27 lb. Paper and board mills: 5,000e. Pulp mills: 9,000.

**Paper/board capacity:** 13,000,000 tons **Pulp capacity:** 9,000,000e tons

| | Production | | Imports | | Exports | |
|---|---|---|---|---|---|---|
| | 1987 | 1988 | 1987 | 1988 | 1987 | 1988 |
| Newsprint | 365 | 334 | 142 | 102 | 20 | 7 |
| Packaging paper/board | 5,236e | 5,720e | 1,101 | 651 | 110 | 155 |
| Other paper/board | 5,810e | 6,591e | 93 | 99 | 190 | 106 |
| **Total** | **11,411e** | **12,645e** | **1,336** | **852** | **320** | **268** |
| Chemical woodpulp | 1,109 | 1,198 | 657 | 746 | 5 | 8 |
| Mechanicals, other pulps | 5,381e | 6,214e | 26 | 49 | 0 | 6 |
| Reed and bagasse | 910 | 938 | — | — | — | — |
| **Total** | **7,400e** | **8,350e** | **683** | **795** | **5** | **14** |

## Finland

Population: 4,947,000. Per capita consumption of paper and board: 204 kg/449 lb. Paper and board mills: 46. Pulp mills: 47 (sulfate: 18; sulfite: 3; semichemical: 3; mechanical: 23).

**Paper/board capacity:** 9,095,000 tons **Pulp capacity:** 9,545,000 tons
**Operating rate 1988:** 95% **Operating rate 1988:** 94%

| | Production | | Imports | | Exports | |
|---|---|---|---|---|---|---|
| | 1987 | 1988 | 1987 | 1988 | 1987 | 1988 |
| Paper | 6,913 | 7,411 | 64 | 74 | 5,837 | 6,170 |
| Board | 1,099 | 1,242 | 21 | 30 | 900 | 1,015 |
| **Total** | **8,012** | **8,653** | **85** | **104** | **6,737** | **7,185** |
| Chemical woodpulp | 5,271 | 5,610 | 52 | 27 | 1,478 | 1,491 |
| Mechanicals, other pulps | 3,190 | 3,391 | 40 | 46 | 163 | 190 |
| **Total** | **8,461** | **9,001** | **92** | **73** | **1,641** | **1,681** |
| Market pulp | 2,027 | 2,108 | 92 | 73 | 1,641 | 1,681 |

## France

Population: 55,789,000. Per capita consumption of paper and board: 142 kg/313 lb. Paper and board mills: 146. Pulp mills: 21 (sulfate: 7; sulfite: 2; semichemical: 1; mechanical: 10; nonwood: 1).

**Paper/board capacity:** 6,550,000 tons **Pulp capacity:** 2,475,000 tons
**Operating rate 1988:** 96.4% **Operating rate 1988:** 88.5%

| | Production | | Imports | | Exports | |
|---|---|---|---|---|---|---|
| | 1987 | 1988 | 1987 | 1988 | 1987 | 1988 |
| Paper | 5,277 | 5,707 | 2,406 | 2,921 | 1,454 | 1,676 |
| Board | 555 | 606 | 633 | 570 | 155 | 194 |
| **Total** | **5,832** | **6,313** | **3,039** | **3,491** | **1,609** | **1,870** |
| Chemical woodpulp | 2,561 | 1,655 | 1,633 | 1,689 | 398 | 405 |
| Mechanicals, other pulps | 469 | 535 | 132 | 56 | 6 | 0 |
| **Total** | **2,092** | **2,190** | **1,765** | **1,745** | **404** | **405** |
| Market pulp | 718 | 754 | 1,765 | 1,745 | 404 | 405 |

## Germany, Fed. Rep.

Population: 60,714,000. Per capita consumption of paper and board: 201 kg/442 lb. Paper and board mills: 174. Pulp mills: 35 (sulfite: 8; semichemical: 1; mechanical: 24).

**Paper/board capacity:** 11,397,000 tons **Pulp capacity:** 2,414,000 tons
**Operating rate 1988:** 94% **Operating rate 1988:** 98%

| | Production | | Imports[1] | | Exports | |
|---|---|---|---|---|---|---|
| | 1987 | 1988 | 1987 | 1988 | 1987 | 1988 |
| Paper | 8,962 | 9,527 | — | 5,103 | — | 3,481 |
| Board | 975 | 1,049 | — | 468 | — | 299 |
| **Total** | **9,937** | **10,576** | **5,134** | **5,571** | **3,384** | **3,780** |

1. Because Fed. Rep. Germany has changed to the Harmonized System, comparison of imports/exports 1987 levels is not possible.

| | | | | | | |
|---|---|---|---|---|---|---|
| Chemical woodpulp | 826 | 850 | 3,134 | 3,235 | 140 | 190 |
| Mechanicals, other pulps | 1,433 | 1,508 | 66 | 98 | — | 12 |
| **Total** | **2,259** | **2,358** | **3,200** | **3,333** | **140** | **202** |
| Market pulp | 282 | 279 | 3,200 | 3,333 | 140 | 202 |

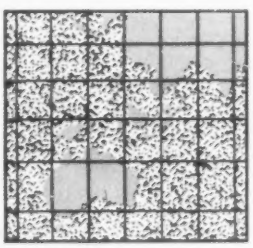
to a 75% share of the massive 450,000-tpy Saiccor Ltd. dissolving pulp mill plus a 50% holding in the highly successful Usutu Pulp Co. in the neighboring country of Swaziland, which has a capacity of 180,000 tpy of unbleached kraft pulp. The latter deal is awaiting approval from the King of Swaziland. The agreement with Courtaulds reinforces Sappi's position as the biggest pulp and paper producer in South Africa. On completion, its capacity will amount to 1.5 million tpy of pulp and 840,000 tpy of paper and board. It will also be one of the leading suppliers in the world of unbleached pulp grades.

Mondi has also started on a major investment program. This year it is rebuilding No. 6 cartonboard paper machine at its Springs mill near Johannesburg, doubling capacity to 81,000 tpy and allowing for further expansion at a later stage. But in addition, it is planning to raise paper capacity at its different mills by a total of 130,000 tpy. Half of the investment of $160 million will go toward the Merebank mill in Durban, where supercalendered paper output will be raised by 45% to 127,000 tpy by a rebuild of No. 1 paper machine. Work will be completed by early 1990. Capacity at the Richards Bay eucalyptus pulp mill will also be boosted to 420,000 tpy.

Elsewhere in Africa, the picture is less encouraging, with rising raw materials costs and shortages of funds for the purchase of spare parts inhibiting industry development. However, some bright spots exist. Zimbabwe's pulp and paper industry ran at full capacity in 1988, and slow and careful expansion of the industry now seems likely. Plans include a new 60,000-tpy kraft pulp line and fine paper machine and expansion at Hunyani Pulp & Paper Industries Ltd., which is the nation's biggest papermaker. Tanzania's industry, although not operating at anything close to capacity, has begun exporting printing/writing and casemaking materials.

Morocco also continues to shine, with Cellulose du Maroc's 100,000-tpy eucalyptus pulp mill operating at full capacity in 1988 and through first-half 1989. There are long-term prospects that a eucalyptus pulp mill could be built in the Congo. Current expansions are already providing pulpwood to some key European mills.

Overall, however, the outlook is bleak for African producers. Rising interest rates can be expected to restrict further the availability of dollars to import raw materials for pulp and papermaking or to expand output. And domestic consumption levels are also limited by the failing economies of most of the African nations. ■



## Asia/ Australasia

Output of paper and board in Asia/Australasia climbed by 9.5% to 52.0 million tons in 1988. It was the first time the continent had broken through the 50-million-ton mark and is a milestone in the development of the region's paper industry. Pulp production also rose strongly by 9%, soaring to 30.4 million tons. Again, a magic number—30 million tons—was crossed for the first time.

Last year was a good one for the major producers: Japan, People's Rep. China, Rep. Korea, and Taiwan. But it was also a year in which growing attention was focused on the rising stars of the continent: Indonesia, Thailand, and Turkey. To the south, the Australasian pulp and paper industries of New Zealand and Australia continued a phase of expansion and internationalization.

The leading paper and board producer of the continent is Japan, which is also the world's second-largest producer. In 1988, its paper and board output soared ahead by 9.3% from 1987 to 24.6 million tons. Most of the increase was fueled by a booming domestic economy, with GNP racing ahead by 5.7%. Commercial printing and advertising led the way in boosting the markets for paper, especially coated grades.

With the value of the yen continuing high against other currencies, Japanese imports might have been expected to rise sharply. To some extent they did because imports passed 1 million tons for the first time, rising by 20.6%. But even so, they still account for only 4% of total Japanese consumption. The yen's high value also effected exports, which tumbled by 22% to 636,000 tons.

A new investment wave swept the Japanese industry in 1988 in response to rising profits. Estimates show that $3.464 million was invested in 1988, a rise of 44% from 1987, and that 57% of the investment is designed to increase capacity, mainly in wood-free paper, all types of coated paper, and newsprint. A large amount of offshore investment is also taking place, with North America a key target for investment yen but with interest growing in Australasia and Europe. In looking for offshore opportunities, Japanese producers are aiming to make use of their burgeoning profits to guarantee their fiber needs for the future, and—anticipating a continuing high value for the yen—to supply the country's import requirements for the future.

People's Rep. China continued its relentless climb up the ladder of the world's leading papermakers in 1988, producing more than 12.6 million tons of paper and board, an increase of nearly 11% from 1987. In just two years (1986-88) its output has grown by more than 25%,

# Top 20 producing nations

## India

Population: 818,782,000. Per capita consumption of paper and board: 3e kg/6e lb. Paper and board mills: 300. Pulp mills: 1.

**Paper/board capacity:** 2,760,000 tons

| | Production | | Imports | | Exports | |
|---|---|---|---|---|---|---|
| | 1987 | 1988 | 1987 | 1988 | 1987 | 1988 |
| Paper | 1,136 | 1,165e | 300 | 300 | — | — |
| Board | 750 | 750e | 0 | 0 | — | — |
| **Total** | **1,886** | **1,915e** | **300** | **300e** | — | — |
| **Total pulp** | **1,050** | **1,050e** | **300** | **300e** | — | — |
| Market pulp | 15 | 30e | 300 | 300e | — | — |

## Italy

Population: 57,265,000. Per capita consumption of paper and board: 108 kg/238 lb. Paper and board mills: 340. Pulp mills: 21 (sulfite: 2; semichemical: 3; mechanical: 15; nonwood: 1).

**Paper/board capacity:** 5,800,000 tons **Pulp capacity:** 1,080,000 tons
**Operating rate 1988:** 93% **Operating rate 1988:** 73%

| | Production | | Imports | | Exports | |
|---|---|---|---|---|---|---|
| | 1987 | 1988 | 1987 | 1988 | 1987 | 1988 |
| Paper | 4,033 | 4,339 | 1,920 | 1,941 | 949 | 1,033 |
| Board | 954 | 1,031 | 204 | 208 | 214 | 276 |
| **Total** | **4,987** | **5,370** | **2,124** | **2,149** | **1,163** | **1,309** |
| Chemical woodpulp | 218 | 230 | 1,938 | 2,017 | 36 | 48 |
| Mechanicals, other pulps | 519 | 559 | 147 | 130 | 8 | 8 |
| **Total** | **737** | **789** | **2,085** | **2,147** | **44** | **56** |
| Market pulp | 250 | 270 | 2,085 | 2,147 | 44 | 56 |

## Japan

Population: 122,424,000. Per capita consumption of paper and board: 204 kg/449 lb. Paper and board mills: 489. Pulp mills: 60 (sulfate: 37; sulfite: 4; semichemical: 8; mechanical: 27; nonwood: 3).

**Paper/board capacity:** 27,143,000 tons **Pulp capacity:** 13,176,000 tons
**Operating rate 1988:** 90.7% **Operating rate 1988:** 69.6%

| | Production | | Imports | | Exports | |
|---|---|---|---|---|---|---|
| | 1987 | 1988 | 1987 | 1988 | 1987 | 1988 |
| Paper | 19,537 | 21,446 | 825 | 914 | 608 | 491 |
| Board | 3,000 | 3,178 | 43 | 133 | 206 | 145 |
| **Total** | **22,537** | **24,624** | **868** | **1,047** | **814** | **636** |
| Chemical woodpulp | 7,607 | 8,055 | 2,031 | 2,331 | 16 | 13 |
| Mechanicals, other pulps | 2,126 | 2,360 | 700 | 759 | 0 | 0 |
| **Total** | **9,733** | **10,415** | **2,731** | **3,090** | **16** | **13** |
| Market pulp | 956 | 917 | 2,731 | 3,090 | 16 | 13 |

## Korea, Rep. of

Population: 42,621,000. Per capita consumption of paper and board: 82 kg/181 lb. Paper and board mills: 150e. Pulp mills: 5 (sulfate: 1; mechanical: 4).

**Paper/board capacity:** 4,674,000 tons **Pulp capacity:** 390,000 tons
**Operating rate 1988:** 89% **Operating rate 1988:** 80%

| | Production | | Imports | | Exports | |
|---|---|---|---|---|---|---|
| | 1987 | 1988 | 1987 | 1988 | 1987 | 1988 |
| Paper | 2,507 | 2,907 | 150 | 172 | 116 | 139 |
| Board | 656 | 752 | 6 | 4 | 282 | 212 |
| **Total** | **3,163** | **3,659** | **156** | **176** | **398** | **351** |
| Chemical woodpulp | 147 | 155 | 739 | 823 | 0 | 0 |
| Mechanicals, other pulps | 168 | 158 | 60 | 82 | 0 | 0 |
| **Total** | **315** | **313** | **799** | **905** | **0** | **0** |
| Market pulp | 147 | 155 | 799 | 905 | 0 | 0 |

## Mexico

Population: 84,884,000. Per capita consumption of paper and board: 30 kg/65 lb. Paper and board mills: 67. Pulp mills: 15 (sulfate: 8; mechanical: 2; nonwood: 5).

**Paper/board capacity:** 3,375,000 tons **Pulp capacity:** 1,060,000 tons
**Operating rate 1988:** 77% **Operating rate 1988:** 76%

| | Production | | Imports | | Exports | |
|---|---|---|---|---|---|---|
| | 1987 | 1988 | 1987 | 1988 | 1987 | 1988 |
| Paper | 2,229 | 2,323 | 61 | 128 | 243 | 252 |
| Board | 275 | 270 | 5 | 15 | 0 | 1 |
| **Total** | **2,575** | **2,593** | **66** | **143** | **243** | **253** |
| Chemical woodpulp | 439 | 433 | 454 | 310 | 20 | 49 |
| Bleached bagasse/straw | 227 | 247 | 0 | 0 | 0 | 0 |
| Mechanicals, other pulps | 134 | 129 | 25 | 43 | 0 | 4 |
| **Total** | **800** | **809** | **479** | **353** | **20** | **53** |

## Netherlands

Population: 14,758,000. Per capita consumption of paper and board: 195 kg/428 lb. Paper and board mills: 32. Pulp mills: 3 (mechanical: 2, nonwood: 1).

**Paper/board capacity:** 2,575,000 tons **Pulp capacity:** 198,000 tons
**Operating rate 1988:** 96% **Operating rate 1988:** 93%

| | Production | | Imports | | Exports | |
|---|---|---|---|---|---|---|
| | 1987 | 1988 | 1987 | 1988 | 1987 | 1988 |
| Paper | 1,495 | 1,720 | 1,580 | 1,695 | 1,028 | 1,221 |
| Board | 673 | 742 | 338 | 399 | 411 | 462 |
| **Total** | **2,168** | **2,462** | **1,918** | **2,094** | **1,439** | **1,683** |
| Chemical woodpulp | 0 | 0 | 561 | 598 | 31 | 22 |
| Mechanicals, other pulps | 135 | 184 | 26 | 23 | 3 | 4 |
| **Total** | **135** | **184** | **587** | **621** | **34** | **26** |

## Spain

Population: 39,053,000. Per capita consumption of paper and board: 99 kg/217 lb. Paper and board mills: 161. Pulp mills: 26 (sulfate: 24; sulfite: 1; mechanical: 5; nonwood: 3).

**Paper/board capacity:** 3,650,000 tons **Pulp capacity:** 174,000 tons
**Operating rate 1988:** 95% **Operating rate 1988:** 96%

| | Production | | Imports | | Exports | |
|---|---|---|---|---|---|---|
| | 1987 | 1988 | 1987 | 1988 | 1987 | 1988 |
| Paper | 2,895 | 3,060 | 689 | 913 | 358 | 367 |
| Board | 357 | 369 | 54 | 14 | 103 | 71 |
| **Total** | **3,252** | **3,429** | **743** | **927** | **461** | **438** |
| Chemical woodpulp | 1,379 | 1,445 | 420 | 410 | 505 | 536 |
| Mechanicals, other pulps | 219 | 220 | 9 | 12 | 7 | 11 |
| **Total** | **1,598** | **1,665** | **429** | **422** | **512** | **547** |
| Market pulp | 803 | 801 | 429 | 422 | 512 | 547 |

## Sweden

Population: 8,346,000. Per capita consumption of paper and board: 242 kg/532 lb. Paper and board mills: 55. Pulp mills: 55 (sulfate: 25; sulfite: 7; semichemical: 2; mechanical: 21).

**Paper/board capacity:** 8,630,000 tons **Pulp capacity:** 10,870,000 tons
**Operating rate 1988:** 95% **Operating rate 1988:** 95%

| | Production | | Imports | | Exports | |
|---|---|---|---|---|---|---|
| | 1987 | 1988 | 1987 | 1988 | 1987 | 1988 |
| Paper | 6,584 | 6,882 | 203 | 196 | 5,084 | 5,356 |
| Board | 1,250 | 1,279 | 85 | 79 | 1,012 | 1,021 |
| **Total** | **7,834** | **8,161** | **288** | **275** | **6,096** | **6,377** |
| Chemical woodpulp | 7,001 | 7,155 | 119 | 103 | 2,416 | 2,463 |
| Mechanicals, other pulps | 2,972 | 3,152 | 25 | 32 | 619 | 728 |
| **Total** | **9,973** | **10,307** | **144** | **135** | **3,035** | **3,191** |
| Market pulp | 3,526 | 3,662 | 144 | 135 | 3,035 | 3,191 |

and it is now the fourth-biggest producer in the world. Per capita consumption, however, is a mere 12.1 kg (26 lb), and similar annual growth rates will have to be sustained if the country is to reach its target of a per capita consumption of 40 kg (88 lb) by the year 2000.

Although it is still soon after the event, it seems unlikely that the recent political and social unrest in the country will lead to a change in the government's economic policy. A continuing program of modernization of existing pulp and paper lines plus further investment in pulp mills can be expected. Among the most interesting projects now under consideration is a 250,000-tpy, joint-venture softwood pulp mill to be built with the U.S.S.R. in Heilongjiang, China. It would use larch pulpwood from Soviet Siberia.

The third-biggest paper producer of the region, Rep. Korea, had an important year in 1988. It played host to the Olympic Games, recorded yet another year of impressive economic growth (GNP rose by 12.2%), and successfully conducted the first fully democratic parliamentary elections in its history. Against this background, producers of printing/writing paper and newsprint fared particularly well. Newsprint, in particular, was in short supply. Coated duplex board also performed well, but for the linerboard industry it was a different story. Overcapacity along with an appreciation of the local currency (the won) against the dollar combined with a fall in demand from Hong Kong and People's Rep. China to dent profitability in this sector. Reductions in the tariffs paid by imports have also damaged this sector of the industry.

Taiwan's paper and board output was up by 7.8% to 2.95 million tons, a figure that is considered disappointing in view of the fast growth of previous years. Reasons for the slowdown were (as for Rep. Korea) some overcapacity, the appreciation of the local currency against the dollar, liberalization of trade, and an increase in imports. Without these factors, output would have crossed the 3-million-ton mark in 1988. A redeeming factor, however, was that exports rose to almost 250,000 tons.

Turning to the rising stars of the East, Indonesia's paper and board output rose by 12.7% in 1988 to 932,000 tons, and the million ton mark should be crossed this year. With its good growing conditions for pulpwood, reserves of mixed tropical hardwood, and favorable location in the Far East market, Indonesia is coming under scrutiny as an investment prospect for the world's pulp- and papermakers. Scott Paper Co. is among those considering new pulp mills, and predictions say that about 1 million tons of new pulp capacity could start up by the end of the century. Last year saw the startup of a new 7.1-m-wide kraft paper and kraft liner machine at domestic producer Kertas Kraft Aceh. It is designed to replace imports in the short term, but some export tonnage will be available in the future.

Also approaching 1 million tons of paper and board output is Turkey. Its output was cut to 715,000 tons by labor disputes last year, but potentially it could approach 850,000 tons in 1989. Several companies view Turkey as a prospect for expansion because of its low per capita consumption of 15 kg (33 lb) and its geographic position between Europe, the Middle East, and Asia.

Thailand is also becoming an attractive site for investment, and many reports are circulating of major pulp mill projects to be based on pulpwood plantations. Interest in the Philippines is also growing, with the largest company there, state-owned Picop, up for sale.

In Australasia, output of paper and board rose by 10% to nearly 2.6 million tons in 1988. There was continuing rationalization in New Zealand, with Australian brewing company Elders Resources winning control of New Zealand Forest Products Ltd. and subsequently announcing a major expansion of the Kinleith kraft liner and market pulp mill in New Zealand. Another New Zealand company, Carter Holt Harvey (CHH) acquired the country's major tissue producer, Caxton Paper Mills Ltd. CHH has also been active overseas in recent years, acquiring a share in Chilean market pulp producer Celulosa Arauco y Constitucion. New Zealand's largest company, Fletcher Challenge Ltd., also looked to Latin America in 1988, buying control of Brazilian newsprint producer Pisa. In Canada, Fletcher merged its Crown Forest Industries Ltd. and British Columbia Forest Products Ltd. subsidiaries under the name Fletcher Challenge Canada. In Australia, it acquired 50% of Australian Newsprint Mills Ltd. At its subsidiary, Tasman Pulp & Paper Co. Ltd. in New Zealand, Fletcher is currently increasing pulp capacity by 30,000 tpy and modernizing its three paper machines, adding an extra 45,000 tpy of newsprint.

Australia witnessed an influx of interest from foreign companies in 1988-89. APPM devised a plan with Noranda Forest Inc. of Canada for a 400,000-tpy pulp mill to be built in Wesley Vale, Tasmania. However, Noranda subsequently withdrew in the face of unacceptable and loosely worded environmental restrictions. Daishowa Paper Manufacturing Co. Ltd. of Japan has now resurrected that project, planning perhaps to make unbleached pulp in Tasmania and export the product for bleaching to Japan. Daishowa is also planning a $365-million mill for Australia. It would make 150,000 tpy of kraft liner for the Australian market and 150,000 tpy of eucalyptus market pulp. Australia's Amcor meanwhile is seeking acquisitions in the paper and packaging sector, with the U.S. and Europe the main target areas for expansion.

The Indian subcontinent is still the weak point in the Asian pulp- and papermaking world. With poor power and fiber supply and the absence of financial resources, India, Pakistan, and Bangladesh are not easily able to boost their output. Efforts are being concentrated on newsprint and printing papers, and in the case of India, some substantial progress has been made in the production of newsprint from a bagasse furnish. ■

# World pulp, paper, and board industry at a glance

| Country | Population (1,000) | Number of mills P&B | Number of mills Pulp | Capacity (1,000 tons) P&B | Capacity (1,000 tons) Pulp | Per capita (lb) | Apparent consumption (1,000 tons) P&B 1987 | Apparent consumption (1,000 tons) P&B 1988 | Apparent consumption (1,000 tons) Pulp 1987 | Apparent consumption (1,000 tons) Pulp 1988 | Production (1,000 tons) P&B 1987 | Production (1,000 tons) P&B 1988 | Production (1,000 tons) Pulp 1987 | Production (1,000 tons) Pulp 1988 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **EUROPE** | | | | | | | | | | | | | | |
| Belgium | 9,925 | 14 | 3 | 1,190 | 450 | 430 | 1,863 | 1,938 | 717 | 770 | 1,030 | 1,134 | 389 | 448 |
| Denmark | 5,119 | 6 | 3 | 344 | 102 | 444 | 982 | 1,034 | 135 | 133 | 323 | 343 | 81 | 95 |
| France | 55,789 | 146 | 21 | 6,550 | 2,475 | 313 | 7,262 | 7,934 | 3,453 | 3,530 | 5,832 | 6,313 | 2,092 | 2,190 |
| Germany, Fed. Rep. | 60,714 | 174 | 35 | 11,397 | 2,414 | 448 | 11,687 | 12,367 | 5,319 | 5,489 | 9,937 | 10,576 | 2,259 | 2,358 |
| Greece | 10,013 | 25 | 2 | 500 | 75 | 143 | 680 | 650 | 230 | 255 | 416 | 375 | 50 | 65 |
| Ireland | 3,650 | 1 | 0 | 40 | 0 | 186 | 305 | 309 | 0 | 0 | 30 | 34 | 0 | 0 |
| Italy | 57,265 | 340 | 21 | 5,800 | 1,080 | 238 | 5,948 | 6,210 | 2,778 | 2,880 | 4,987 | 5,370 | 737 | 789 |
| Netherlands | 14,758 | 32 | 3 | 2,575 | 198 | 428 | 2,647 | 2,873 | 668 | 779 | 2,168 | 2,462 | 135 | 184 |
| Portugal | 10,246 | 90 | 8 | 833 | 1,453 | 143 | 602 | 664 | 396 | 420 | 627 | 681 | 1,408 | 1,472 |
| Spain | 39,053 | 161 | 33 | 3,650 | 174 | 221 | 3,534 | 3,918 | 1,515 | 1,540 | 3,252 | 3,429 | 1,598 | 1,665 |
| United Kingdom | 56,799 | 92 | 7 | 4,676 | 466 | 360 | 8,734 | 9,285 | 2,325 | 2,501 | 4,183 | 4,295 | 389 | 421 |
| **EEC** | **323,331** | **1,081** | **136** | **37,555** | **8,887** | **321** | **44,244** | **47,162** | **17,558** | **18,297** | **32,785** | **35,012** | **9,138** | **9,687** |
| Finland | 4,947 | 46 | 47 | 9,095 | 9,545 | 699 | 1,360 | 1,572 | 6,912 | 7,393 | 8,012 | 8,653 | 8,461 | 9,001 |
| Norway | 4,200 | 19 | 23 | 1,900 | 2,150 | 333 | 569 | 635 | 1,382 | 1,359 | 1,590 | 1,670 | 1,889 | 1,917 |
| Sweden | 8,346 | 55 | 55 | 8,630 | 10,870 | 543 | 2,026 | 2,059 | 7,082 | 7,251 | 7,834 | 8,161 | 9,973 | 10,307 |
| **Nordic** | **17,493** | **120** | **125** | **19,625** | **22,565** | **537** | **3,955** | **4,266** | **15,376** | **16,003** | **17,436** | **18,484** | **20,323** | **21,225** |
| Austria | 7,493 | 33 | 14 | 3,001 | 1,686 | 318 | 1,001 | 1,083 | 1,408 | 1,541 | 2,357 | 2,650 | 1,333 | 1,455 |
| Iceland | 249 | 0 | 0 | 0 | 0 | 230 | 27 | 26 | 0 | 0 | 0 | 0 | 0 | 0 |
| Malta | 347 | 0 | 0 | 0 | 0 | 63 | 10 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| Switzerland | 6,567 | 29 | 6 | 1,250 | 365 | 459 | 1,327 | 1,370 | 596 | 634 | 1,147 | 1,216 | 324 | 335 |
| **Other W. Europe** | **14,656** | **62** | **20** | **4,251** | **2,051** | **374** | **2,365** | **2,489** | **2,004** | **2,175** | **3,504** | **3,866** | **1,657** | **1,790** |
| **Total W. Europe** | **355,480** | **1,263** | **281** | **61,431** | **33,503** | **334** | **50,564** | **53,937** | **34,938** | **36,475** | **53,725** | **57,362** | **31,118** | **32,702** |
| Albania | 3,134 | 4 | 4 | 15e | 15e | 11 | 17 | 15 | 10 | 10 | 10 | 10 | 10 | 10 |
| Bulgaria | 8,995 | 15 | 9 | 520e | 260e | 108 | 440 | 440 | 271 | 270 | 350 | 350 | 220 | 220 |
| Czechoslovakia | 15,624 | 36 | 23 | 1,261 | 1,223 | 172 | 1,181 | 1,220 | 890 | 918 | 1,261 | 1,259 | 1,090 | 1,121 |
| German Dem. Rep. | 16,661 | 21 | 19 | 1,500e | 750e | 184 | 1,356 | 1,395 | 835 | 835 | 1,339 | 1,362 | 672 | 690 |
| Hungary | 10,600 | 10 | 4 | 550e | 150e | 143 | 668 | 688 | 272 | 292 | 522 | 535 | 69 | 81 |
| Poland | 37,960 | 47 | 20 | 1,560 | 1,057 | 83 | 1,391 | 1,431 | 1,090 | 1,110 | 1,375 | 1,444 | 906 | 921 |
| Romania | 23,048 | 20e | 12e | 850e | 750e | 70 | 728 | 730 | 660 | 660 | 768 | 770 | 610 | 610 |
| USSR | 283,682 | 173 | 54 | 11,494 | 11,000e | 78 | 9,869 | 10,025 | 9,111 | 9,185 | 10,566 | 10,750 | 9,974 | 10,065 |
| Yugoslavia | 23,569 | 30 | 21 | 1,500 | 900 | 106 | 1,086 | 1,133 | 879 | 943 | 1,343 | 1,377 | 800 | 837 |
| **E. Europe** | **423,273** | **356** | **166** | **19,250** | **16,105** | **89** | **16,736** | **17,077** | **14,018** | **14,223** | **17,534** | **17,857** | **14,351** | **14,555** |
| **Total Europe** | **778,753** | **1,619** | **447** | **80,681** | **49,608** | **201** | **67,300** | **71,014** | **48,956** | **50,698** | **71,259** | **75,219** | **45,469** | **47,257** |
| **NORTH AMERICA** | | | | | | | | | | | | | | |
| Canada | 26,093 | 109 | 36 | 17,028 | 25,021 | 520 | 5,592 | 6,169 | 14,976 | 15,470 | 16,045 | 16,638 | 23,013 | 23,679 |
| United States | 245,414 | 548 | 217 | 72,862 | 56,860 | 685 | 74,478 | 76,394 | 53,990 | 55,086 | 67,534 | 69,477 | 54,026 | 55,530 |
| **North America** | **271,507** | **657** | **253** | **89,890** | **81,881** | **660** | **80,070** | **82,563** | **68,966** | **70,556** | **83,579** | **86,115** | **77,039** | **79,209** |
| **ASIA** | | | | | | | | | | | | | | |
| Afghanistan | 15,090 | 0 | 0 | 0 | 0 | <1 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bahrain | 481 | 0 | 0 | 0 | 0 | 28 | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bangladesh | 109,579 | 8 | 9 | 127 | 126 | 2 | 117 | 125 | 99 | 99 | 115 | 122 | 83 | 76 |
| Bhutan | 1,451 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Brunei | 249 | 0 | 0 | 0 | 0 | 26 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Burma | 39,966 | 3 | 2 | 31 | 30 | 3 | 47 | 47 | 27 | 27 | 27 | 27 | 29 | 29 |
| China, Peo. Rep.[1] | 1,096,140 | 200 | 50e | 13,000e | 9,000e | 27 | 12,427 | 13,229 | 8,078 | 9,131 | 11,411 | 12,645 | 7,400 | 8,350 |
| Cyprus | 687 | 1 | 0 | 10e | 0 | 119 | 37 | 37 | 1 | 1 | 2 | 2 | 0 | 0 |
| Hong Kong | 5,692 | 2 | 0 | 85e | 0 | 323 | 810 | 837 | 0 | 0 | 10 | 17 | 0 | 0 |
| India | 818,782 | 300 | 100e | 2,760 | 1,450e | 5 | 2,075 | 1,915 | 1,350 | 1,350 | 1,886 | 1,915 | 1,050 | 1,050 |
| Indonesia | 174,951 | 40 | 17e | 1,162 | 747 | 10 | 783 | 829 | 575 | 658 | 827 | 932 | 350 | 467 |
| Iran | 53,126 | 6 | 2 | 315 | 188 | 18 | 422 | 426 | 75 | 77 | 105 | 142 | 60 | 65 |
| Iraq | 17,656 | 0 | 0 | 0 | 0 | 9 | 65 | 68 | 39 | 76 | 25 | 28 | 14 | 18 |
| Israel | 4,442 | 5 | 0 | 186 | 0 | 228 | 414 | 461 | 66 | 67 | 164 | 179 | 0 | 0 |
| Japan | 122,424 | 489 | 60 | 27,143 | 13,176 | 450 | 22,591 | 25,035 | 12,448 | 13,492 | 22,537 | 24,624 | 9,733 | 10,415 |
| Jordan | 3,943 | 3 | 0 | 180 | 0 | 37 | 67 | 67 | 5 | 4 | 14 | 10 | 0 | 0 |
| Kampuchea | 7,869 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Korea, Peo. Rep. | 21,902 | 0 | 0 | 0 | 0 | 8 | 80 | 80 | 70 | 70 | 80 | 80 | 60 | 60 |
| Korea, Rep. of | 42,621 | 150e | 5 | 4,674 | 390 | 180 | 2,921 | 3,484 | 1,114 | 1,218 | 3,163 | 3,659 | 315 | 313 |
| Kuwait | 1,938 | 1 | 0 | 25 | 0 | 103 | 91 | 91 | 10 | 10 | 23 | 23 | 0 | 0 |
| Laos | 3,874 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lebanon | 2,827 | 3 | 0 | 50e | 0 | 35 | 75 | 45 | 5 | 5 | 15 | 15 | 0 | 0 |
| Macao | 443 | 0 | 0 | 0 | 0 | 20 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Malaysia | 16,573 | 14 | 1 | 220 | 92 | 73 | 502 | 547 | 27 | 27 | 82 | 204 | 0 | 0 |
| Mongolia | 2,092 | 1 | 1 | 10e | 6e | 21 | 20 | 20 | 5 | 5 | 5 | 5 | 5 | 5 |
| Nepal | 18,033 | 2 | 2 | 8 | 8 | 3 | 20 | 21 | 0 | 0 | 4 | 7 | 0 | 0 |
| Oman | 1,377 | 0 | 0 | 0 | 0 | 10 | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pakistan | 114,939 | 15 | 3 | 160e | 100e | 6 | 344 | 288 | 116 | 111 | 98 | 101 | 75 | 70 |
| Philippines | 59,456 | 27 | 3 | 506 | 195 | 20 | 509 | 534 | 198 | 163 | 308 | 341 | 146 | 113 |
| Qatar | 340 | 0 | 0 | 0 | 0 | 65 | 10 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| Saudi Arabia | 13,070 | 0 | 0 | 0 | 0 | 17 | 100 | 100 | 0 | 0 | 0 | 0 | 0 | 0 |
| Singapore | 2,645 | 2 | 0 | 31 | 0 | 183 | 0 | 220 | 6 | 6 | 0 | 10 | 0 | 0 |
| Sri Lanka | 16,779 | 2 | 2 | 27 | 26 | 4 | 27 | 27 | 15 | 15 | 27 | 27 | 6 | 6 |
| Syria | 11,638 | 13 | 14 | 8e | 6e | 15 | 80 | 80 | 5 | 5 | 5 | 5 | 5 | 5 |
| Taiwan | 19,900 | 0 | 3 | 3,250e | 500e | 337 | 2,880 | 3,045 | 713 | 765 | 2,737 | 2,949 | 416 | 425 |
| Thailand | 54,124 | 33 | 5 | 724 | 150e | 33 | 825 | 825 | 210 | 230 | 610 | 610 | 150 | 170 |
| Turkey | 53,536 | 35 | 14 | 964 | 726 | 34 | 850 | 818 | 540 | 492 | 816 | 715 | 450 | 352 |
| United Arab Emirates | 1,501 | 0 | 0 | 0 | 0 | 110 | 73 | 75 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vietnam | 64,227 | 30e | 1 | 120e | 60e | 2 | 66 | 66 | 55 | 60 | 60 | 60 | 25 | 30 |
| Yemen Arab Rep. | 7,534 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Yemen Dem. Rep. | 2,339 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Asia** | **3,006,236** | **1,385** | **294** | **55,776** | **26,976** | **39** | **49,357** | **53,482** | **25,852** | **28,164** | **45,156** | **49,454** | **20,372** | **22,019** |

1. Peo. Rep. China has an approximate total of 5,000 paper mills and 9,000 pulp mills. Only the largest 250 are included here.

| Country | Population (1,000) | Number of mills P&B | Number of mills Pulp | Capacity (1,000 tons) P&B | Capacity (1,000 tons) Pulp | Per capita (lb) | Apparent consumption (1,000 tons) P&B 1987 | Apparent consumption (1,000 tons) P&B 1988 | Apparent consumption (1,000 tons) Pulp 1987 | Apparent consumption (1,000 tons) Pulp 1988 | Production (1,000 tons) P&B 1987 | Production (1,000 tons) P&B 1988 | Production (1,000 tons) Pulp 1987 | Production (1,000 tons) Pulp 1988 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LATIN AMERICA** | | | | | | | | | | | | | | |
| Argentina | 31,536 | 100 | 25 | 1,300 | 880 | 70 | 1,140 | 1,000 | 708 | 700 | 1,064 | 1,001 | 725 | 727 |
| Bahamas | 253 | 0 | 0 | 0 | 0 | 130 | 15 | 15 | 0 | 0 | 0 | 0 | 0 | 0 |
| Barbados | 257 | 0 | 0 | 0 | 0 | 60 | 7 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Belize | 174 | 0 | 0 | 0 | 0 | 38 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bolivia | 6,918 | 1 | 0 | 2e | 0 | 7 | 21 | 21 | 0 | 0 | 1 | 1 | 0 | 0 |
| Brazil | 144,427 | 146 | 38 | 5,446 | 4,523 | 58 | 4,371 | 3,825 | 3,366 | 3,290 | 4,712 | 4,639 | 4,137 | 4,296 |
| Chile | 12,748 | 7 | 7 | 423 | 900e | 61 | 350 | 352 | 338 | 381 | 442 | 450 | 861 | 910 |
| Colombia | 30,566 | 24 | 5 | 563 | 266 | 42 | 573 | 587 | 293 | 290 | 488 | 504 | 247 | 247 |
| Costa Rica | 2,866 | 2 | 1 | 18 | 25 | 92 | 122 | 120 | 7 | 7 | 12 | 12 | 6 | 6 |
| Cuba | 10,154 | 9 | 3 | 155e | 60e | 70 | 322 | 321 | 105 | 110 | 149 | 150 | 52 | 55 |
| Dominican Rep. | 6,867 | 2 | 0 | 15e | 0 | 21 | 65 | 65 | 4 | 4 | 9 | 9 | 0 | 0 |
| Ecuador | 10,203 | 5 | 2 | 65 | 35 | 21 | 97 | 97 | 17 | 17 | 67 | 67 | 6 | 6 |
| El Salvador | 5,026 | 3 | 0 | 50e | 0 | 29 | 67 | 67 | 12 | 12 | 29 | 29 | 0 | 0 |
| Guatemala | 8,680 | 4 | 0 | 60 | 0 | 22 | 72 | 86 | 9 | 9 | 34 | 40 | 0 | 0 |
| Guyana | 1,006 | 0 | 0 | 0 | 0 | 15 | 7 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Haiti | 6,263 | 0 | 0 | 0 | 0 | 2 | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Honduras | 4,830 | 0 | 0 | 0 | 0 | 13 | 29 | 29 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jamaica | 2,446 | 1 | 0 | 15 | 0 | 39 | 43 | 43 | 1 | 1 | 13 | 13 | 0 | 0 |
| Mexico | 84,884 | 87 | 15 | 3,375 | 1,060 | 64 | 2,398 | 2,483 | 1,259 | 1,109 | 2,575 | 2,593 | 800 | 809 |
| Neth. Antilles | 188 | 0 | 0 | 0 | 0 | 35 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nicaragua | 3,622 | 0 | 0 | 0 | 0 | 5 | 8 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| Panama | 2,322 | 3 | 0 | 30e | 0 | 79 | 83 | 83 | 1 | 1 | 28 | 28 | 0 | 0 |
| Paraguay | 4,040 | 3 | 0 | 25e | 0 | 14 | 26 | 26 | 0 | 0 | 13 | 13 | 0 | 0 |
| Peru | 21,254 | 17 | 3 | 405 | 270 | 31 | 235 | 303 | 144 | 151 | 148 | 218 | 90 | 92 |
| Surinam | 392 | 0 | 0 | 0 | 0 | 22 | 9 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Trinidad/Tobago | 1,243 | 0 | 0 | 0 | 0 | 58 | 48 | 33 | 2 | 2 | 0 | 0 | 0 | 0 |
| Uruguay | 3,081 | 5 | 2 | 83 | 27 | 49 | 64 | 69 | 36 | 33 | 58 | 66 | 27 | 26 |
| Venezuela | 18,756 | 12 | 3 | 785 | 184 | 108 | 811 | 922 | 395 | 372 | 654 | 708 | 101 | 103 |
| **Latin America** | **425,002** | **411** | **104** | **12,815** | **8,230** | **55** | **10,995** | **10,585** | **6,697** | **6,489** | **10,496** | **10,541** | **7,052** | **7,277** |
| **AUSTRALASIA** | | | | | | | | | | | | | | |
| Australia | 16,358 | 18 | 19 | 2,050e | 1,100e | 342 | 2,373 | 2,544 | 1,174 | 1,051 | 1,678 | 1,854 | 964 | 1,051 |
| Fiji | 700 | 0 | 0 | 0 | 0 | 41 | 12 | 13 | 0 | 0 | 0 | 0 | 0 | 0 |
| New Zealand | 3,356 | 6 | 7 | 822 | 1,463 | 345 | 533 | 527 | 591 | 653 | 644 | 701 | 1,108 | 1,212 |
| Papua New Guinea | 3,804 | 0 | 0 | 0 | 0 | 4 | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Samoa | 204 | 0 | 0 | 0 | 0 | 32 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Australasia** | **24,422** | **24** | **26** | **2,872** | **2,563** | **279** | **2,927** | **3,093** | **1,765** | **1,704** | **2,322** | **2,555** | **2,072** | **2,263** |
| **AFRICA** | | | | | | | | | | | | | | |
| Algeria | 23,841 | 6 | 3 | 160e | 170e | 17 | 180 | 180 | 95 | 95 | 110 | 110 | 35 | 35 |
| Angola | 9,481 | 2 | 1 | 30e | 45e | 4 | 19 | 19 | 15 | 15 | 15 | 15 | 15 | 15 |
| Benin | 4,448 | 0 | 0 | 0 | 0 | 2 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Botswana | 1,198 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Burkina Faso | 8,529 | 0 | 0 | 0 | 0 | <1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Burundi | 5,147 | 0 | 0 | 0 | 0 | 2 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cameroon | 10,674 | 0 | 0 | 0 | 0 | 2 | 10 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central African Rep. | 2,771 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chad | 5,401 | 0 | 0 | 0 | 0 | <1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Congo | 1,888 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Egypt | 51,453 | 16 | 3 | 180e | 60e | 24 | 550 | 560 | 100 | 100 | 160 | 160 | 70 | 70 |
| Ethiopia | 44,727 | 1 | 0 | 15e | 0 | 1 | 21 | 21 | 4 | 4 | 11 | 11 | 0 | 0 |
| Gabon | 1,094 | 0 | 0 | 0 | 0 | 4 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Gambia | 812 | 0 | 0 | 0 | 0 | 6 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ghana | 14,130 | 0 | 0 | 0 | 0 | 1 | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| Guinea | 6,540 | 0 | 0 | 0 | 0 | 1 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ivory Coast | 11,612 | 0 | 0 | 0 | 0 | 15 | 77 | 80 | 0 | 0 | 0 | 0 | 0 | 0 |
| Kenya | 23,100 | 5 | 6 | 103 | 100 | 11 | 119 | 119 | 100 | 100 | 106 | 106 | 96 | 96 |
| Lesotho | 1,676 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Liberia | 2,396 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Libya | 4,232 | 10 | 0 | 10e | 0 | 7 | 14 | 14 | 6 | 6 | 6 | 6 | 0 | 0 |
| Madagascar | 11,238 | 2 | 2 | 28 | 6 | 2 | 8 | 8 | 7 | 7 | 8 | 8 | 4 | 4 |
| Malawi | 7,884 | 0 | 0 | 0 | 0 | 3 | 12 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mali | 8,824 | 0 | 0 | 0 | 0 | <1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mauritania | 1,916 | 0 | 0 | 0 | 0 | 5 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mauritius | 1,077 | 0 | 0 | 0 | 0 | 12 | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Morocco | 23,910 | 7 | 1 | 126 | 100 | 23 | 233 | 251 | 51 | 18 | 115 | 115 | 101 | 108 |
| Mozambique | 14,845 | 2 | 0 | 10e | 0 | 2 | 17 | 17 | 1 | 1 | 2 | 2 | 0 | 0 |
| Niger | 6,688 | 0 | 0 | 0 | 0 | 1 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nigeria | 105,471 | 5 | 2 | 170 | 140 | 8 | 403 | 403 | 51 | 52 | 79 | 79 | 39 | 40 |
| Rwanda | 6,755 | 0 | 0 | 0 | 0 | 2 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Senegal | 6,978 | 0 | 0 | 0 | 0 | 1 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sierra Leone | 3,946 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Somalia | 7,106 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| South Africa | 33,747 | 17 | 10 | 2,000e | 2,160e | 85 | 1,260 | 1,309 | 1,230 | 1,220 | 1,581 | 1,661 | 1,840 | 1,885 |
| Sudan | 23,797 | 2 | 0 | 7 | 0 | 3 | 26 | 29 | 0 | 0 | 10 | 10 | 0 | 0 |
| Swaziland | 737 | 1 | 1 | 5e | 180 | 9 | 2 | 3 | -3 | 5 | 2 | 3 | 180 | 178 |
| Tanzania | 25,397 | 2 | 4 | 69 | 76 | 1 | 14 | 16 | 37 | 35 | 32 | 30 | 37 | 35 |
| Togo | 3,247 | 0 | 0 | 0 | 0 | <1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tunisia | 7,809 | 5 | 1 | 50e | 25e | 27 | 90 | 97 | 30 | 30 | 30 | 37 | 20 | 20 |
| Uganda | 17,189 | 1 | 0 | 5e | 0 | 1 | 7 | 7 | 2 | 2 | 2 | 2 | 0 | 0 |
| Zaire | 33,755 | 1 | 0 | 4e | 0 | 1 | 11 | 11 | 2 | 2 | 3 | 3 | 0 | 0 |
| Zambia | 7,851 | 1 | 0 | 30 | 0 | 1 | 7 | 5 | 0 | 0 | 3 | 5 | 0 | 0 |
| Zimbabwe | 9,125 | 3 | 2 | 90 | 41 | 22 | 84 | 90 | 59 | 62 | 80 | 82 | 37 | 40 |
| **Africa** | **604,442** | **89** | **36** | **3,092** | **3,103** | **12** | **3,222** | **3,319** | **1,787** | **1,754** | **2,355** | **2,445** | **2,474** | **2,526** |
| **TOTAL WORLD** | **5,110,382** | **4,185** | **1,160** | **245,126** | **172,361** | **98** | **213,871** | **224,056** | **154,023** | **159,365** | **215,167** | **226,329** | **154,478** | **160,551** |

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# Top 20 producing nations

## Taiwan

Population: 19,900,000. Per capita consumption of paper and board: 149 kg/327 lb. Paper and board mills: 152. Pulp mills: 3 (sulfate: 2; nonwood: 1).

**Paper/board capacity:** 3,250,000e tons **Pulp capacity:** 500,000e tons

| | Production | | Imports | | Exports | |
|---|---|---|---|---|---|---|
| | 1987 | 1988 | 1987 | 1988 | 1987 | 1988 |
| Paper | 2,091 | 2,282 | 276 | 335 | 67 | 146 |
| Board | 646 | 667 | 12 | 8 | 78 | 101 |
| **Total** | **2,737** | **2,949** | **288** | **343** | **145** | **247** |
| Chemical woodpulp | 331 | 350 | 335 | 367 | 65 | 86 |
| Bleached begasse | 73 | 73 | 0 | — | 16 | 14 |
| Mechanical, other pulps | 12 | 2 | 44 | 74 | 1 | 1 |
| **Total** | **416** | **425** | **379** | **441** | **82** | **101** |

## United Kingdom

Population: 56,799,000. Per capita consumption of paper and board: 163 kg/360 lb. Paper and board mills: 92. Pulp mills: 7 (semichemical: 2; mechanical: 3; nonwood: 2).

**Paper/board capacity:** 4,676,000 tons **Pulp capacity:** 466,000 tons
**Operating rate 1988:** 96% **Operating rate 1988:** 95%

| | Production | | Imports | | Exports | |
|---|---|---|---|---|---|---|
| | 1987 | 1988 | 1987 | 1988 | 1987 | 1988 |
| Paper | 3,337 | 3,410 | 4,396 | 4,965 | 458 | 608 |
| Board | 846 | 885 | 887 | 823 | 274 | 190 |
| **Total** | **4,183** | **4,295** | **5,283** | **5,788** | **732** | **798** |
| Chemical woodpulp | NA | NA | 1,737 | 1,851 | 1 | 1 |
| Mechanicals, other pulps | NA | NA | 203 | 237 | 3 | 7 |
| **Total** | **399** | **421** | **1,940** | **2,088** | **4** | **8** |

## United States

Population: 245,414,000. Per capita consumption of paper and board: 317 kg/69 lb. Paper and board mills: 548. Pulp mills: 217 (sulfate: 125; sulfite: 17; semichemical: 36; mechanical: 39).

**Paper/board capacity:** 72,862,000 tons **Pulp capacity:** 56,860,000 tons
**Operating rate 1988:** 95.4% **Operating rate 1988:** 97.7%

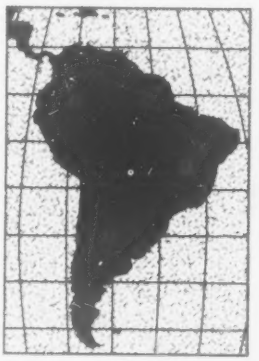
| | Production | | Imports | | Exports | |
|---|---|---|---|---|---|---|
| | 1987 | 1988 | 1987 | 1988 | 1987 | 1988 |
| Paper | 56,546 | 56,264 | 10,864 | 11,109 | 2,978 | 3,355 |
| Board | 10,988 | 11,213 | 137 | 102 | 1,079 | 939 |
| **Total** | **67,534** | **69,477** | **11,001** | **11,211** | **4,057** | **4,294** |
| Chemical woodpulp | 47,663 | 48,899 | 4,137 | 4,010 | 3,749 | 4,212 |
| Mechanicals, other pulps | 6,363 | 6,631 | 263 | 561 | 687 | 803 |
| **Total** | **54,026** | **55,530** | **4,400** | **4,571** | **4,436** | **5,015** |
| Market pulp | 7,361 | 7,770 | 2,935 | 3,149 | 4,373 | 4,600 |

## U.S.S.R.

Population: 283,682,000. Per capita consumption of paper and board: 38 kg/83 lb. Paper and board mills: 173. Pulp mills: 54 (sulfate: 21; sulfite: 34; semichemical: 7).

**Paper/board capacity:** 11,494,000 tons **Pulp capacity:** 9,244,000 tons
**Operating rate 1988:** 94e%

| | Production | | Imports | | Exports | |
|---|---|---|---|---|---|---|
| | 1987 | 1988 | 1987 | 1988 | 1987 | 1988 |
| Paper | 9,348 | 9,500e | 225 | 235e | 906 | 905e |
| Board | 1,218 | 1,250e | — | — | — | — |
| **Total** | **10,566** | **10,750e** | **555** | **575e** | **1,252** | **1,300e** |
| Chemical woodpulp | 7,180 | 7,225e | 222 | 221e | 1,088 | 1,096e |
| Mechanicals, other pulps | 2,794 | 2,840e | 3 | 4e | — | — |
| **Total** | **9,974** | **10,065e** | **225** | **225e** | **1,088** | **1,100e** |
| Market pulp | 3,212 | 3,250e | 225 | 225e | 1,088 | 1,100e |



# Latin America

The performance of the Latin American paper and board industries was disappointing in 1988. Output of paper and board crawled ahead by less than half of one percentage point to 10.5 million tons in the face of weak domestic markets. But pulp production rose a more healthy 3% to 7.3 million tons on the back of good export sales.

The overall picture in 1989 is one of contrasts. Ingrained economic problems in many countries are retarding industry development. Yet investment activity in the pulp and paper industry has never been stronger, with large amounts of foreign money flowing in.

Brazil, the continent's dominant producer, is the key example of this paradox. Its economy is stalled, with inflation apparently out of control, foreign debt running above $100 million, and its financial, social, and political institutions too weak to do anything about it. In 1988, the overall industrial growth index of the country fell by 3.2%. Yet pulp and paper industry investment plans valued at $8.800 million are on the drawing board and will double production by 1995. The reasons for investor confidence despite the poor showing of the industry are clear: Brazil has the fastest-growing pulpwood trees in the world. And its pulp and paper industry is now a recognized and established exporter, earning $1.4 million of Brazil's balance of payments surplus of $19 million.

Among the most noticeable expansion projects are Aracruz Celulose SA's 520,000-tpy expansion to 1 million tpy by the end of 1991, Cenibra SA's new 350,000-tpy line, and Bahia do Sul's 420,000-tpy pulp mill for startup in 1992. Other projects include Copener/Riocell's 340,000-tpy mill, for which a third partner is being sought and a project formulated by a consortium of non-integrated papermakers for a 350,000-tpy mill, which is believed to be at an advanced stage. Many other proposals are under discussion, including a plan by Champion International's Brazilian subsidiary to build a new pulp and printing/writing paper mill in the state of Mato Grosso do Sul and preliminary studies by Jari to double capacity in the late 1990s.

New paper machines are also being planned by Ripasa SA, which is building a 145,000-tpy paper machine with 70% of the output destined for export, and Grupo Votorantim, which is installing two paper machines at the former Guatapara mill. Pisa, part of the New Zealand group Fletcher Challenge, is building a new newsprint paper machine for startup in 1994. The booming

export business is attracting newcomers to the industry. Most noticeable is Inpacel, a subsidiary of a bank, which is to begin pine chemi-thermomechanical pulp (CTMP) and mechanical printing paper production in 1991.

But the investment boom is not limited to Brazil. Even in Argentina, which arguably is Latin America's most turbulent economy, some reason for optimism exists. Most noticeable is a project between domestic company Arcor, Citicorp, and BAT Industries to build a new 300,000-tpy eucalyptus pulp mill in the Entre Rios province. Canadian interest has also been strong, with Consolidated-Bathurst Inc. combining with two domestic companies to study a 100,000-tpy CTMP mill

Across the border, in the more stable economic climate of Chile, three major projects are pressing ahead. Shell International, Scott Paper Co., and Citibank have combined to build the 265,000-tpy Santa Fe pulp mill for startup in 1992. It will be the first mill in Chile to use plantation eucalyptus. The rest of the industry is based on radiata pine. Celulosa Arauco y Constitucion has also given the green light to a major new pulp line at its Arauco mill. Also for startup by the end of 1992, it will make 350,000 tpy of bleached kraft pulp. Chile's other major company, CMPC, has teamed up with the Simpson Paper Co. of the U.S. for its major project—a 315,000-tpy bleached kraft pulp mill, Celulosa del Pacifico, which should start up by the end of 1990.

Further north, Venezuela is investing $300 million in new plant and equipment. Among the investments are Cartonera del Caribe Ca's new 50-tpd packaging board paper machine, an extra 30,000 tpy of capacity at Smurfit Cartones Nacionales SA, and an extra 90,000 tpy of capacity at Venepal. Colombia meanwhile is planning marginal increases in capacity in 1989, with the startup of the 87,000-tpy Papelcol SA mill in 1990.

The performance of Central America is dominated by Mexico. In 1988, the Mexican economy showed some positive signs, with a modest GNP growth of 1.1% and a rapid fall in inflation due to austerity measures. But the massive debt problem persists. Under these circumstances, paper and board output rose slightly to 2.6 million tons, and consumption rose 3.6%, largely fueled by imports. Several large projects are planned, and some of the output will be destined for export. Industrias Centauro's 250,000-tpy linerboard machine should start up this year. Grupo Durango is building a second pine market CTMP line near Durango City. Capacity will be 75,000 tpy. An 80,000-tpy fine paper machine will be installed by Ponderosa Industrial at Celulosa de Chihuahua mill.

The outlook for Latin America for the end of this year and 1990 hinges on finding solutions to the continent's long-term economic problems. If that could be done, the current interest of foreign investors could become a flood of venture capital. ■

# Europe

Total paper and board output in Europe rose 5.6% to 75.2 million tons in 1988. Within that total, different parts of the continent enjoyed varying fortunes: Western Europe (including the Nordic countries) recorded a rise in output of 6.8% at 57.4 million tons. Eastern Europe turned in a relatively static performance, with output up by an estimated 1.8% to 17.9 million tons. Apparent consumption for the whole continent also set a new record at 71 million tons, up 5.5%, and apparent per capita consumption was 91.2 kg (200.6 lb). Again, there was a disparity between West and East. For the western nations, per capita consumption averaged 152 kg (334.4 lb); for the eastern countries, it was slightly below the world average at an estimated 40 kg (88 lb).

Production of pulp in Europe also reached a new record level, rising 3.9% to 47.3 million tons. Some 32.7 million tons of the total was produced in Western Europe. Apparent pulp consumption was 50.7 million tons for the whole continent, another record.

The nations of the European Community (EC) had an exceptional year in terms of both output and investment. Advertising and commercial print boomed, pushing up demand for printing paper, while strong growth (economic overheating in some countries) kept the packaging sector buoyant.

The EC's biggest producer, Fed. Rep. Germany, again set new highs for paper and board production and consumption. Its output of all grades passed 10 million tons for the first time, rising 6% to 10.6 million tons. Some 42% of the output is printing grades, while packaging grades account for 37%. France's paper producers put in an impressive performance, with output rising 8.2% from 1987 to 6.3 million tons. Consumption rose even faster, up 9.2%. Italy also set records, with output crossing 5 million tons for the first time. The U.K.'s output climbed steadily by 2.7% to 4.3 million tons.

Many paper producers feel that the removal of internal barriers to trade within the EC at the end of 1992 will make little difference to their business activity. They argue that pulp and paper are already internationally traded commodities; the removal of borders will merely simplify customs controls. But many are expecting deregulation of the transport systems in Europe, which should cut costs, and more central regulation of political issues, such as the environment. Changes will also probably occur in distribution patterns.

Producers from outside the EC, however, have fears of being excluded when European borders are removed.

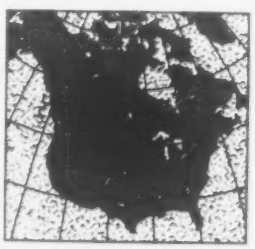
A boom in investment has taken place in the EC in the past two years, with Nordic and North American companies arriving in strength. It would be wrong, though, to say that all of this investment is driven by the opening of borders in 1992. Rather, it is a response to the formation of a single market of 320 million people, to the competitive advantages to be found by making commodity grades of paper closer to their consumers, and to the comparatively low per capita consumption of some (mainly southern) EC countries.

For the Nordic nations of Sweden, Norway, and Finland, 1988 was another year of full capacity utilization. Finnish output of paper and board, having crossed 8 million tons for the first time in 1987, passed 8.5 million tons in 1988. Sweden rose above 8 million tons for the first time. Norway maintained its full capacity output level of around 1.6 million tons. Over the past six record years, the Nordic industry has slimmed down into internationally powerful papermaking groups. A reassessment of investment policy, with more high-value-added products in the Nordic countries and more bulk-grade production moved nearer to the consumer markets, has been one result of this.

In Eastern Europe, after years of stagnation, there are moves to revitalize the pulp and paper industry. Nowhere is this more apparent than in the U.S.S.R. Although it is the fifth-largest paper producer in the world, the U.S.S.R. has a per capita consumption below the world average. New plans formulated by the ministry responsible for the pulp and paper industry have set a target of doubling per capita consumption by 1995. The plans foresee major investment and an opening up of the Soviet industry to foreign capital. Investors from outside the U.S.S.R. may participate in joint-venture projects, especially in the newsprint, printing paper, and market pulp sectors. Depending on circumstances, they will be allowed to hold a majority share of the joint ventures formed, set market prices, and repatriate funds to their shareholders abroad.

Already there are some takers: Finnish company Metsä-Serla is building a joint-venture tissue mill in Estonia, and companies in Austria, Canada, Italy, and Fed. Rep. Germany are believed to be involved in talks with Soviet authorities.

If the plans advance rapidly, several foreign companies may find the U.S.S.R. an attractive place to invest. Its large population, low per capita consumption, and big forest reserves could well justify the investment. And if the U.S.S.R. sets a course of letting in foreign capital, most other eastern European nations may well follow.■



# North America

North American pulp and paper producers operated their mills at close to maximum capacity last year and reported record profits. Continued economic expansion in the U.S. and Canada supported the third successive year of production gains for the industry. Exports were assisted by the low value of the U.S. dollar against other currencies.

Total North American output of paper and board reached a record-high 86.2 million tons in 1988, up 3.1% from 1987. Among individual grades, newsprint output was up 2.8% to 15.39 million tons, printing/ writing paper was up 6.8% to 22.7 million tons, and packaging grades were up 2.6% to 29.17 million tons (kraft linerboard production rose 4.2% to 17.59 million tons). Total imports rose by 4.4% to 12.2 million tons, while total exports reached 15.7, up 3.4% from 1987.

Pulp production in North America climbed to 78.84 million tons, a 2.2% increase. Market pulp output was 15.9 million tons, up 3.6% from 1987. Pulp exports climbed to 13.1 million tons, a 10% gain from 1987.

Wastepaper consumption in North American mills increased 4.6% to 18.5 million tons. Wastepaper exports jumped 20% to 5.0 million tons.

In the large U.S. market, strong demand from the printing and publishing industry as well as increased use of office copiers and personal computers pushed domestic output of printing/writing paper up 5.2% to 19.59 million tons and raised imports by 16.6% to 2.5 million tons. The continued growth of consumer packaged goods stimulated demand for all major grades of case-making materials. Total production of containerboard grew 2.2% to 21.3 million tons, while boxboard packaging grades grew 3.3% to 7.1 million tons. Among other grades, tissue paper production increased 3.3% to 5.0 million tons.

Canada's industry produced 24.9 million tons of pulp, paper, and paperboard in 1988. Nearly 90% of the newsprint and 35% of the pulp produced by Canadian companies is exported, and most of Canada's exports are destined for the huge U.S. market. Newsprint output grew 3.1% to nearly 10 million tons, but shipments slackened off at the end of the year as demand weakened. Printing/writing and specialty paper output increased 9.7% to 3.4 million tons, stimulated by strong demand in the U.S. and Canada. Packaging paper and board output remained almost unchanged at 3.3 million tons. Market pulp exports were up about 1.1% to 8.16 million tons.

This year, it seems that production gains will not match those achieved in 1988 because economic expansion and demand growth in both Canada and the U.S. will be lower than last year. ■

# SPOTTED OWL CONTROVERSY ADDS TO PACIFIC NORTHWEST TIMBER CRUNCH

## As supplies tighten, the region looks for ways to balance its forest products industry with environmental concerns, export demands

By PERTHENIA A. HYDE

The forest products industry is struggling to overcome the timber supply problems plaguing production throughout the Pacific Northwest. The entire industry is making changes to secure its future, including the profitability of pulp- and papermaking in the region. While skirmishes over the northern spotted owl tie up the courts, the timber supply dwindles.

The problem is reaching crisis proportions as sawmills throughout Oregon and Washington close. According to Bill Pickell, Washington Contract Loggers Assn., 34 mills have closed in the past 18 months. Most sawmills are running on reduced supplies, substantially raising the price of residual chips. "The general tightness in the chip supply has been caused by a number of sawmills closing down," explained Bob Fukano, Mitsubishi International Corp., Atlanta, Ga. "There isn't as much residual chip being made, so they have to whole-log chip, which is a costlier operation," he said. Because 75% to 85% of the pulping fiber used in the Pacific Northwest comes from plywood and sawmill residue chips, the timber shortage will ultimately affect pulp and paper manufacturing.

Several factors support the current supply shortage. According to analyst R.W. Hammerstedt, the Pacific Northwest faces the phenomena of "falldown," the slack period before second growth becomes available for harvest and after large-scale logging of primary timberstands occurs. This process is expected to create a trend toward smaller tree size and lower volume of available timber throughout North America.

This general downturn in timber supply has been compounded by environmental concerns and heavy exportation. Sawmills, after two years of high production, now face general reductions in U.S. Forest Service (USFS) timber available for harvest, court injunctions that further limit access to public forestlands, and high export demand for unprocessed logs.

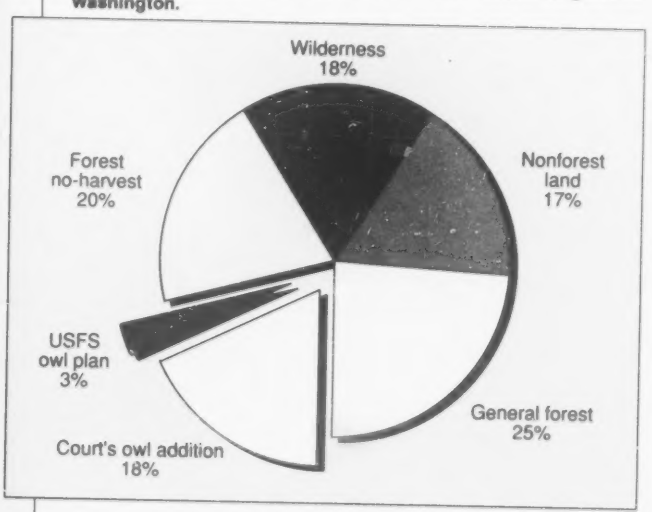
The forest products industry is starting to make itself heard on all issues impacting timber supply. Grass roots groups are sprouting up all over Washington and Oregon to make the public aware of the crisis. In June, 650 log trucks paraded through downtown Seattle, Wash., to demonstrate the importance of forest products to the state's economy. The same weekend, in Eugene, Ore., a similar demonstration attracted 1,327 logging trucks. A rally in Salem, Ore., was attended by 2,000 industry supporters from all over the region.

Most timber supply problems confronting the Pacific Northwest affect sawmills and plywood plants. Right now, demand for pulp is strong in both foreign and domestic markets. "Prices are about double what they were a few years back," said a fiber supply manager, "but there are a few clouds on the horizon."

**SUPPLY THREATENS INDUSTRY.** Pulp producers do not have current shortages but may face dwindling chip supplies while pulp demand remains high. "The concern is about what will happen to our supply," said Mike Sullivan, Potlatch Corp., Lewiston, Idaho.

*Ms. Hyde is a summer intern for Pulp & Paper from the Univ. of Puget Sound, Tacoma, Wash.*

*FIGURE 1:* **National forestland allocations in western Oregon and Washington.**



**Log trucks clogging downtown Seattle are a reminder of the forest product industry's role in local economies (photo by Kurt Smith, *Seattle Post-Intelligencer*).**

"Most of our pulp and paper mills in the Pacific Northwest rely substantially on chips that are produced from plywood manufacturers and sawmill operations that are dependent on national forest timber, so we stand to have a reduction in our supply of chips furnished for papermaking if those mills suffer from a lack of logs," Sullivan explained. According to the Northwest Forestry Council, 55% of the 12 million bone-dry units (bdu) used for pulp mill fiber comes from logs harvested on public lands.

"The slowdown could potentially come late this year or early next year, when sawmills that don't have any stumpage ledger or have a very small stumpage ledger in front of them will have to start to level off," explained an area fiber supply manager. Chip prices are soaring due to sawmill closures, a downturn in housing starts, and strong demand for woodfiber from both foreign and domestic markets.

**HOUSING STARTS ARE DOWN.** An important indicator of industry strength, May housing starts declined 2.1% to an adjusted annual rate of 1.31 million. Construction rates fell 13.5% from April 1988. Housing starts, with little hope of reversing, wallow at their lowest levels since December 1982, when high interest rates drove the housing industry down and reduced demand for processed lumber.

**MULTIPLE-USE CONFLICTS STOP SALES.** Even if the level of housing starts dropped to the 1981-82 level, timber would still be in short supply. The real battle the industry faces is in the courts and in Congress. Court injunctions stopped 163 timber sales of federal lands from taking place in western Washington and Oregon this year.

"Our problem here in the Pacific Northwest is a fixed land base and a growing population," said John Marker, USFS. "A lot of people are involved in the issue of how that land should be used. The timber industry is only one group that wants access to the resources on national forestlands. Multiple-use issues, such as protection of watersheds and fish spawning streams, are compounded by preservationist groups pushing to protect the ancient forests."

"Right now, we are looking at a program that would be reduced outside of the spotted owl controversy," Marker said. Measures to protect the spotted owl have added to the planned reductions of 15% to 20% of allowable cut in the next five years.

This year, the USFS's annual sale program in Washington and Oregon has come virtually to a halt due to court injunctions, primarily over the northern spotted owl. The northern spotted owl seems to nest and reproduce only in the ancient forestlands. The spotted owl, environmentalists claim, is an indicator species for other animals that prefer to reside in old-growth forestlands. USFS and the Fish & Wildlife Service are currently collecting evidence on the number of owls living in the affected areas, their breeding habits, and their habitational requirements to help decide whether or not to list the birds as threatened or endangered species. Although Fish & Wildlife has recommended that the owl be listed as a threatened species, the courts are requiring more evidence before they rule on the injunctions. At the same time, both agencies have begun the lengthy process required by the Endangered Species Act. "We've started working on the process, which could take about a year," Marker said. "We haven't been stopped from selling timberlands by the endangered species law but by the court injunctions."

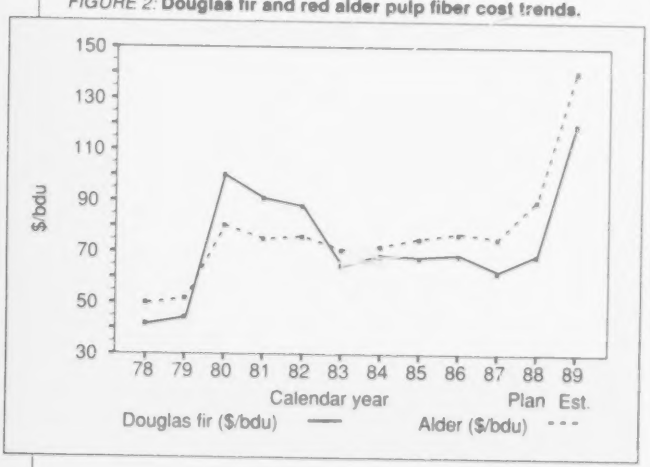
The courts have, at the request of Fish & Wildlife and USFS, indefinitely postponed the trial involving lands under injunction because of the spotted owl. At this time, all 163 timber sales are also postponed indefinitely. When the case finally goes to trial, according to Marker, USFS hopes to bring in new evidence to show that the injunction is not needed.

The court injunctions and appeals process alone will limit USFS to selling only half of its harvest plan for 1989 and perhaps 60% in 1990. Normally, USFS offers 4.8 billion bd ft for sale annually. One and a half billion bd ft are currently under injunctions, nearly 24% of 1989 planned sales. USFS thinks it will "be able to offer a program but probably only a modest one at best, compared to what we've done in the past," according to Marker.

The National Forest Products Assn. (NFPA) and several industry officials believe the spotted owl in the Pacific Northwest is an indication of long-term disagreements over land use facing the industry. Environmental issues like those plaguing the Pacific Northwest are surfacing throughout the U.S. In the South, 65 timber sales from federal forestlands are tied up by controversies over the endangered red-cockaded woodpecker. Unlike northwestern mills, however, most southern mills do not rely heavily on federal timber harvesting. This lack of dependency makes environmental concerns less detrimental to their manufacturing costs.

**EXPORTS AFFECT SUPPLY.** Although the spotted owl has received a great deal of blame for the current timber supply crunch, many believe the real shortage is caused by heavy exports of raw logs to Asia. Some sawmill workers in Washington and Oregon, nearly out of a job at mills that rely heavily on federal timber, have seen truckloads of timber from private and state land loaded onto ships for export. Bans prevent the export of logs from national forestlands, but record exports from state and privately managed timberland are crossing the ocean, primarily to Japan, making it a major competitor for the limited timber supply.

*FIGURE 2:* **Douglas fir and red alder pulp fiber cost trends.**




While the lumber industry struggles to survive this difficult period, pulp and paper manufacturers battle soaring woodchip costs. With prices higher than they have been in years, little interest exists in simply waiting out the crisis. In June, the export price for Douglas fir was $118.00/bdu f.o.b./vessel, and red alder was selling at $117.00/bdu f.o.b./vessel. By comparison, in second-quarter 1986, Douglas fir sold for $77.40/bdu f.o.b./vessel and alder brought in $90/bdu/f.o.b./vessel. These huge jumps reflect the current high demand for chips.

Currently, the tight market is creating "a psychology of shortages," according to Sullivan. "The spotted owl is adding to this psychology. All timber off public lands is sold by silent auction, and fear is pushing prices up." From third-quarter 1987 to third-quarter 1988, the price of U.S. Forest timber rose from $130 to $160/1,000 bd ft. Now, the timber is not available even at elevated prices. This situation, combined with environmental problems facing the region, sent some industry leaders to their government representatives.

**SPLIT OPINIONS ON LEGISLATION.** Some congressional leaders are taking action. Sen. Robert Packwood (D-Ore.) and Rep. Peter DeFazio (D-Ore.) have both initiated legislation that would provide individual states with the power to decide where their raw logs should be processed. This legislation challenges a 1984 Supreme Court ruling. That ruling found an Alaskan law, which required that logs taken from state-managed lands be processed prior to export, in violation of the federal authority's right to regulate international trade. Currently, states do not have the power to make legislative decisions that involve foreign trade, which is considered a part of foreign policy.

Some members of the Pacific Northwest's contingency to Washington D.C. are not in favor of Packwood's bill. Washington Sen. Slade Gorton opposes the legislation for two reasons. First, Packwood's bill allows individual states to set foreign trade policy. In addition, Gorton believes that the clause included in Packwood's bill allowing the practice of substituting logs exported from private- or state-managed lands would hurt small mills in Oregon and Washington.

Optimistic about the message Congress is sending out, Idaho has already begun enacting legislation that would permit only 5% of timber from state-managed lands to be offered for export. On June 27, 1989, Oregon voters decided overwhelmingly to keep state-managed timber available to local mills with a similar initiative.

The Washington state constitution requires that the state sell timber from its 1.5-million acres to the highest bidder, but it does not specify any requirements for the 621,000 acres of land the state manages for its counties. Washington Gov. Booth Gardner is currently looking into using these lands to aid struggling local sawmills.

While some involved in the region's forest products industry push for legislative restrictions, others lobby for greater freedom. The Bush Administration has announced a plan to remove the ban on timber exports from federal lands to generate favorable trade with Japan and reduce the trade deficit. While this action would lower export prices, it could make stumpage more expensive for domestic mills and increase sawmill closures in the Pacific Northwest, making the chip supply even tighter. In light of recent allegations of unfair trade practices made by U.S. Trade Rep. Carla Hills and substantial congressional support for Sen. Packwood's second bill making the export ban a permanent law, the Bush Administration probably will not pursue this plan.

Sen. Mark Hatfield (R-Ore.) organized a summit meeting between industry leaders, politicians, and environmental groups to work toward resolving the complicated issues surrounding timber supply. The goals of the June 24 meeting were to establish nonlegislative plans and to assess the need for long-term legislative answers. Although the summit was primarily for fact finding, the congressional delegation proposed a short-term solution to the timber supply problem.

The proposed compromise between the industry and environmental groups would have limited the amount of net merchantable sawtimber available out of the ancient forests but would have created a dependable flow of timber through 1990. Currently, the allowable sales quantity (ASQ) for USFS is 4.35 billion bd ft for 1989 and 4.5 billion bd ft for 1990. The proposed reductions would have changed USFS's ASQ to 3.8 billion bd ft for 1989 and 4.2 billion for 1990. The proposal also called for limiting ASQ from Bureau of Land Management forests to 2 billion bd ft during fiscal 1989 and 1990.

If all parties had agreed on it, this proposal would have become part of a federal USFS budget appropriations bill for 1990. In return, the nine environmental groups involved in litigation over the spotted owl would have ended in 1989 court cases tying up federal lands. The compromise, however, was declined by environmental groups concerned about the exact wording of the proposal.

The industry is uniting to push for public awareness through national channels as well. NFPA joined with other forest industry trade associations and forest user groups in forming the American Forest Resource Alliance (AFRA). AFRA's purpose is to unite the industry to obtain a reliable wood supply. One goal of the Alliance is to mount a publicity campaign presenting the industry's views on issues like the spotted owl.

**INDUSTRY MEETS SUPPLY CHALLENGES.** Aside from the publicity and legislative measures being proposed, the pulp and paper industry must examine its future. "All options are being explored by everyone in our industry," said Sullivan. "Everything becomes an option when supplies get tight," he noted.

Pulp mills are using more salvage wood and paying higher prices for hard-to-recover wood. "A dramatic difference exists between land harvested two years ago and now," explained Sullivan. "A lot of material used to be left behind because, with the variable chip prices, it was uneconomical to bring it out. Economics alone justify bringing it out now," he said. Some companies ship timber to woodyards with the tops left on for chipping.

In addition to spending more on whole-log chipping and cleaning up the forest floor, some Pacific Northwest mills may transport chips from the South or add more facilities for wastepaper recycling, and some offshore companies are looking at buying southern pine chips.

Kenneth Clemens, Southern Wood Products Marketing Group, Mobile, Ala., commented, "It gets to the point where the price for fiber (for export) in the South with freight is the same as or lower than the price in the Pacific Northwest." The last time prices reached that type of equilibrium was in 1980, causing the volume of southern exports to Japan to increase dramatically.

"The constricting supply and increasing prices in the Pacific Northwest will hurt our competitive position," according to Sullivan. "The Southeast has the potential for becoming a strong competitor," he said. Currently, some major exporting companies are encouraging Japanese buyers to divert ships to southern ports for pine, but there is very little interest.

Domestic pulp and paper producers are uncertain about transporting southern chips for use in Pacific Northwest mills. Longview Fibre Co., Longview, Wash., is discussing the potential of southern woodchips as a possible future chip source. According to Longview Fibre spokesman Curt Copenhagen, the company is exploring transportation costs, the key factor in the decision. Longview is also doubling its capacity to recycle old corrugated containers.

**WHAT DOES THE FUTURE HOLD?** As pulp and paper mills throughout the Pacific Northwest face the supply crisis, they optimistically look to the future of the industry. "We have some current difficulties, but we've been there before," a supply manager from a large mill explained. "There are a number of adjustments we can make that will bring us back into a better situation. There are many in our industry that have the capability to use secondary fiber but are not doing so. In the future, we'll see a lot more secondary fiber used by the brown board, newsprint, and tissue industries. It might get worse before it gets better, but things will adjust."

Sullivan commented, "Our management here in Idaho has made a commitment to invest nearly a half-million dollars in our pulp and paper and related operations. Those investments are being made on the conviction that the pulp and paper industry's future is very strong from a market standpoint and from the standpoint of available labor force and adequate timber markets. The only problem is an adequate chip supply." ■